



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

October 27, 2014

Mr. David A. Heacock
President and Chief Nuclear Officer
Dominion Energy Kewaunee, Inc.
Innsbrook Technical Center
5000 Dominion Boulevard
Glen Allen, VA 23060-6711

SUBJECT: KEWAUNEE POWER STATION – EXEMPTIONS FROM CERTAIN
EMERGENCY PLANNING REQUIREMENTS AND RELATED SAFETY
EVALUATION (TAC NO. MF2567)

Dear Mr. Heacock:

The U.S. Nuclear Regulatory Commission (NRC) has approved the enclosed exemptions from specific requirements of Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50.47, "Emergency plans," and Appendix E, "Emergency Planning and Preparedness for Production and Utilization Facilities," to 10 CFR Part 50. This action is in response to your application for exemptions dated July 31, 2013, "Request for Exemptions from Portions of 10 CFR 50.47 and 10 CFR 50, Appendix E Section IV," supplemented by letters dated December 11, 2013, and January 10, 2014.

A copy of the exemptions and the NRC staff's safety evaluation are also enclosed. The exemptions will be forwarded to the Office of the Federal Register for publication.

Sincerely,

A handwritten signature in black ink, appearing to read "James K. for", is written above the typed name.

Thomas J. Wengert, Senior Project Manager
Plant Licensing IV-2 and Decommissioning
Transition Branch
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-305

Enclosures:

1. Exemptions
2. Safety Evaluation

cc w/encl: Distribution via Listserv

ENCLOSURE 1

EXEMPTIONS

DOMINION ENERGY KEWAUNEE, INC.

KEWAUNEE POWER STATION

DOCKET NO. 50-305

NUCLEAR REGULATORY COMMISSION

Docket No. 50-305; NRC-20YY-XXXX

Dominion Energy Kewaunee, Inc.

Kewaunee Power Station

AGENCY: Nuclear Regulatory Commission.

ACTION: Exemption; issuance.

SUMMARY: Kewaunee Power Station (KPS) is a decommissioning nuclear power reactor that permanently shut down on May 7, 2013, and permanently defueled on May 14, 2013. In response to a request from Dominion Energy Kewaunee, Inc. (DEK or the licensee), the U.S. Nuclear Regulatory Commission (NRC) is granting exemptions from certain emergency planning (EP) requirements. The exemptions will eliminate the requirements to maintain offsite radiological emergency plans and reduce the scope of the onsite emergency planning activities at the Kewaunee Power Station (KPS) based on the reduced risks of accidents that could result in an offsite radiological release when compared to operating power reactors. The exemptions will continue to maintain requirements for onsite radiological emergency planning and include provisions for capabilities to communicate and coordinate with offsite response authorities. The NRC staff has concluded that the exemptions being granted by this action will maintain an acceptable level of emergency preparedness at KPS given its permanently shutdown and defueled status, and that there is reasonable assurance that adequate offsite protective

measures can and will be taken by State and local government agencies, if needed, in the event of a radiological emergency at the KPS facility.

ADDRESSES: Please refer to Docket ID <INSERT: NRC-20YY-XXXX> when contacting the NRC about the availability of information regarding this document. You may obtain publicly-available information related to this document using any of the following methods:

- **Federal Rulemaking Web site:** Go to <http://www.regulations.gov> and search for Docket ID <INSERT: NRC-20YY-XXXX>. Address questions about NRC dockets to Carol Gallagher; telephone: 301-287-3422; e-mail: Carol.Gallagher@nrc.gov. For technical questions, contact the individual(s) listed in the **FOR FURTHER INFORMATION CONTACT** section of this document.

- **NRC's Agencywide Documents Access and Management System (ADAMS):**
You may access publicly available documents online in the NRC Library at <http://www.nrc.gov/reading-rm/adams.html>. To begin the search, select "ADAMS Public Documents" and then select "Begin Web-based ADAMS Search." For problems with ADAMS, please contact the NRC's Public Document Room (PDR) reference staff at 1-800-397-4209, 301-415-4737, or by e-mail to pdr.resource@nrc.gov. The ADAMS Accession number for each document referenced in this document (if that document is available in ADAMS) is provided the first time that a document is referenced.

- **NRC's PDR:** You may examine and purchase copies of public documents at the NRC's PDR, Room O1-F21, One White Flint North, 11555 Rockville Pike, Rockville, Maryland 20852.

FOR FURTHER INFORMATION CONTACT: William Huffman, Office of Nuclear Reactor Regulation, U.S. Nuclear Regulatory Commission, Washington DC 20555-0001; telephone: 301-415-2046; e-mail: William.Huffman@nrc.gov.

I. Background

The KPS facility is a decommissioning power reactor located on approximately 900 acres in Carlton (Kewaunee County), Wisconsin, 27 miles southeast of Green Bay, Wisconsin. The licensee, DEK, is the holder of KPS Renewed Facility Operating License No. DPR-43. The license provides, among other things, that the facility is subject to all rules, regulations, and orders of the NRC now or hereafter in effect.

By letter dated February 25, 2013 (ADAMS Accession No. ML13058A065), DEK submitted a certification to the NRC indicating it would permanently cease power operations at KPS on May 7, 2013. On May 7, 2013, DEK permanently shut down the KPS reactor. On May 14, 2013, DEK certified that it had permanently defueled the KPS reactor vessel (ADAMS Accession No. ML13135A209). As a permanently shutdown and defueled facility, and in accordance with § 50.82(a)(2) of Title 10 of the *Code of Federal Regulations* (10 CFR), KPS is no longer authorized to operate the reactor or emplace nuclear fuel into the reactor vessel. Kewaunee Power Station is still authorized to possess and store irradiated nuclear fuel. Irradiated fuel is currently being stored onsite in a spent fuel pool (SFP) and in Independent Spent Fuel Storage Installation (ISFSI) dry casks.

During normal power reactor operations, the forced flow of water through the reactor coolant system (RCS) removes heat generated by the reactor. The RCS, operating at high temperatures and pressures, transfers this heat through the steam generator tubes converting non-radioactive feedwater to steam, which then flows to the main turbine generator to produce electricity. Many of the accident scenarios postulated in the updated safety analysis reports (USARs) for operating power reactors involve failures or malfunctions of systems which could affect the fuel in the reactor core, which in the most severe postulated accidents, would involve the release of large quantities of fission products. With the permanent cessation of reactor operations at KPS and the permanent removal of the fuel from the reactor core, such accidents are no longer possible. The reactor, RCS, and supporting systems are no longer in operation and have no function related to the storage of the irradiated fuel. Therefore, postulated accidents involving failure or malfunction of the reactor, RCS, or supporting systems are no longer applicable.

Since KPS is permanently shutdown and defueled, the only design basis accident that could potentially result in an offsite radiological release at KPS is the fuel handling accident. Analysis performed by DEK showed that 90 days after KPS permanently shutdown, the radiological consequence of the fuel handling accident would not exceed the limits established by the U.S. Environmental Protection Agency's (EPA's) Protective Action Guidelines (PAGs) at the exclusion area boundary. Based on the time that KPS has been permanently shutdown (approximately 17 months), there is no longer any possibility of an offsite radiological release from a design basis-accident that could exceed the EPA PAGs.

The EP requirements of 10 CFR 50.47, "Emergency plans," and Appendix E to 10 CFR Part 50, "Emergency Planning and Preparedness for Production and Utilization Facilities," continue to apply to nuclear power reactors that have permanently ceased operation and have removed all fuel from the reactor vessel. There are no explicit regulatory provisions

distinguishing EP requirements for a power reactor that is permanently shutdown and defueled from a reactor that is authorized to operate. In order for DEK to modify the KPS emergency plan to reflect the reduced risk associated with the permanently shutdown and defueled condition of KPS, certain exemptions from the EP regulations must be obtained before the KPS emergency plan can be amended.

II. Request/Action.

By letter dated July 31, 2013, "Request for Exemptions from Portions of 10 CFR 50.47 and 10 CFR 50, Appendix E" (ADAMS Accession No. ML13221A182), DEK requested exemptions from certain EP requirements of 10 CFR Part 50 for KPS. More specifically, DEK requested exemptions from certain planning standards in 10 CFR 50.47(b) regarding onsite and offsite radiological emergency plans for nuclear power reactors; from certain requirements in 10 CFR 50.47(c)(2) that require establishment of plume exposure and ingestion pathway emergency planning zones for nuclear power reactors; and from certain requirements in 10 CFR 50, Appendix E, Section IV, which establishes the elements that make up the content of emergency plans. In a letter dated December 11, 2013 (ADAMS Accession No. ML13351A040), DEK provided responses to the NRC staff's request for additional information (RAI) concerning the proposed exemptions. In a letter dated January 10, 2014, DEK provided a supplemental response to the RAI (ADAMS Accession No. ML14016A078), which contained information applicable to the SFP inventory makeup strategies for mitigating the potential loss of water inventory due to a beyond design-basis accident. The information provided by DEK included justifications for each exemption requested. The exemptions requested by DEK will eliminate the requirements to maintain offsite radiological emergency plans, reviewed by the Federal Emergency Management Agency (FEMA) under the requirements of 44 CFR 350, and

reduce the scope of onsite emergency planning activities. DEK stated that application of all of the standards and requirements in 10 CFR 50.47(b), 10 CFR 50.47(c) and 10 CFR Part 50, Appendix E is not needed for adequate emergency response capability based on the reduced risks at the permanently shutdown and defueled facility. If offsite protective actions were needed for a very unlikely accident that could challenge the safe storage of spent fuel at KPS, provisions exist for offsite agencies to take protective actions using a comprehensive emergency management plan (CEMP) under the National Preparedness System to protect the health and safety of the public. A CEMP in this context, also referred to as an emergency operations plan (EOP), is addressed in FEMA Comprehensive Preparedness Guide 101, "Developing and Maintaining Emergency Operations Plans." Comprehensive Preparedness Guide 101 is the foundation for State, territorial, Tribal, and local emergency planning in the United States. It promotes a common understanding of the fundamentals of risk-informed planning and decision making and helps planners at all levels of government in their efforts to develop and maintain viable, all-hazards, all-threats emergency plans. An EOP is flexible enough for use in all emergencies. It describes how people and property will be protected; details who is responsible for carrying out specific actions; identifies the personnel, equipment, facilities, supplies and other resources available; and outlines how all actions will be coordinated. A comprehensive emergency management plan is often referred to as a synonym for "all hazards planning."

III. Discussion.

In accordance with 10 CFR 50.12, "Specific exemptions," the Commission may, upon application by any interested person or upon its own initiative, grant exemptions from the requirements of 10 CFR Part 50 when: (1) the exemptions are authorized by law, will not

present an undue risk to public health or safety, and are consistent with the common defense and security; and (2) any of the special circumstances listed in 10 CFR 50.12(a)(2) are present. These special circumstances include, among other things, that the application of the regulation in the particular circumstances would not serve the underlying purpose of the rule or is not necessary to achieve the underlying purpose of the rule.

As noted previously, the current EP regulations contained in 10 CFR 50.47(b) and Appendix E to 10 CFR Part 50 apply to both operating and shutdown power reactors. The NRC has consistently acknowledged that the risk of an offsite radiological release at a power reactor that has permanently ceased operations and removed fuel from the reactor vessel is significantly lower, and the types of possible accidents are significantly fewer, than at an operating power reactor. However, EP regulations are silent with regard to the fact that once a power reactor permanently ceases operation, the consequences of credible emergency accident scenarios are reduced. The reduced risks generally relate to a decrease in the potential for any significant offsite radiological release based on the preclusion of accidents applicable to an operating power reactor and on the reduced decay heat, and the decay of short-lived radionuclides as spent fuel ages. NUREG-1738, "Technical Study of Spent Fuel Pool Accident Risk at Decommissioning Nuclear Power Plants," dated February 2001 (ADAMS Accession No. ML010430066), confirmed that for permanently shutdown and defueled power reactors bounded by the assumptions and conditions in the report, the risk of offsite radiological release is significantly less than for an operating power reactor.

Similar to the EP exemptions requested by DEK, prior EP exemptions granted to permanently shutdown and defueled power reactors did not relieve the licensees of all EP requirements. Rather, the exemptions allowed the licensees to modify their emergency plans commensurate with the credible site-specific risks that were consistent with a permanently shutdown and defueled status. Specifically, precedent for the approval of the exemptions from

certain EP requirements for previous permanently shutdown and defueled power reactors were based on demonstrating that: (1) the radiological consequences of design-basis accidents would not exceed the limits of the EPA PAGs at the exclusion area boundary, and; (2) in the unlikely event of a beyond design-basis accident resulting in a loss of all modes of heat transfer from the fuel stored in the SFP, there is sufficient time to initiate appropriate mitigating actions, and if needed, for offsite authorities to implement offsite protective actions using a CEMP approach to protect the health and safety of the public.

With respect to design-basis accidents at KPS, the licensee provided analysis demonstrating that 90 days after KPS was permanently shutdown, the radiological consequences of the only remaining design-basis accident with potential for offsite radiological release (the fuel handling accident) will not exceed the limits of the EPA PAGs at the exclusion area boundary. Therefore, because KPS has been permanently shutdown for approximately 17 months, there is no longer any design-basis accident that would warrant an offsite radiological emergency plan meeting the requirements of 10 CFR Part 50.

With respect to beyond design-basis accidents at KPS, the licensee analyzed the two bounding beyond design-basis accidents that have a potential for a significant offsite release. One of these beyond design-basis accidents involves a complete loss of SFP water inventory, where cooling of the spent fuel would be primarily accomplished by natural circulation of air through the uncovered spent fuel assemblies. The licensee's analysis of this accident shows that by October 30, 2014, air cooling of the spent fuel assemblies will be sufficient to keep the fuel within a safe temperature range indefinitely without fuel damage or offsite radiological release. The other beyond design-basis accident analysis performed by the licensee could not completely rule out the possibility of a radiological release from a SFP. This more limiting analysis assumes an incomplete drain down of the SFP water, or some other catastrophic event (such as a complete drainage of the SFP with rearrangement of spent fuel rack geometry and/or

the addition of rubble to the SFP), that would effectively impede any decay heat removal through all possible modes of cooling. The licensee's analysis demonstrates that as of October 21, 2014, there would be at least 10 hours after the loss of all cooling means considered in the analysis for the described beyond design-basis accident, before the spent fuel cladding would reach a temperature where the potential for a significant offsite radiological release could occur. This analysis conservatively does not consider the period of time from the initiating event causing a loss of SFP water inventory until all cooling means are lost.

The NRC staff has verified DEK's analyses and its calculations. The analyses provide reasonable assurance that in granting the requested exemption to DEK, there is no design-basis accident that will result in an offsite radiological release exceeding the EPA PAGs at the site boundary. In the unlikely event of a beyond design-basis accident affecting the SFP that results in a complete loss of heat removal via all modes of heat transfer, there will be at least 10 hours available before an offsite release might occur and, therefore, at least 10 hours to initiate appropriate mitigating actions to restore a means of heat removal to the spent fuel. If a radiological release were projected to occur under this unlikely scenario, a minimum of 10 hours is considered sufficient time for offsite authorities to implement protective actions using a CEMP approach to protect the health and safety of the public.

The NRC staff reviewed the licensee's justification for the requested exemptions against the criteria in 10 CFR 50.12(a), in addition to considering the basis for prior EP exemption requests as discussed above, to determine whether the exemptions should be granted. After evaluating the exemption requests, the staff determined, as described below, that the criteria in 10 CFR 50.12(a) are met, and that the exemptions should be granted. Assessment of the DEK EP exemptions is described in SECY-14-0066, "Request by Dominion Energy Kewaunee, Inc. for Exemptions from Certain Emergency Planning Requirements," dated June 27, 2014 (ADAMS Accession No. ML14072A257). The Commission approved the NRC staff's intention

to grant the exemptions in the staff requirements memorandum (SRM) to SECY-14-0066, dated August 7, 2014 (ADAMS Accession No. ML14219A366). Descriptions of the specific exemptions being granted to DEK, with the NRC staff's basis for granting each exemption, are provided in SECY-14-0066 and summarized in a table at the end of this document. The staff's detailed review and technical basis for the approval of the specific EP exemptions being granted to DEK are provided in the NRC staff's safety evaluation enclosed in NRC letter dated October 27, 2014 (ADAMS Accession No. ML14261A223).

A. Authorized by Law

The licensee has proposed exemptions from certain EP requirements in 10 CFR 50.47(b), 10 CFR 50.47(c)(2), and 10 CFR 50, Appendix E, Section IV, that would allow DEK to revise the KPS Emergency Plan to reflect the permanently shutdown and defueled condition of the station. As stated above, in accordance with 10 CFR 50.12, the Commission may, upon application by any interested person or upon its own initiative, grant exemptions from the requirements of 10 CFR Part 50. The NRC staff has determined that granting of the licensee's proposed exemptions will not result in a violation of the Atomic Energy Act of 1954, as amended, or the Commission's regulations. Therefore, the exemptions are authorized by law.

B. No Undue Risk to Public Health and Safety

As stated previously, DEK provided analyses that show the radiological consequences of design-basis accidents will not exceed the limits of the EPA PAGs at the exclusion area boundary. Therefore, offsite radiological emergency plans required under 10 CFR Part 50 are no longer needed for protection of the public beyond the exclusion area boundary based on the radiological consequences of design-basis accidents still possible at KPS.

Although very unlikely, there are postulated beyond design-basis accidents that might result in significant offsite radiological releases. However, NUREG-1738 confirms that the risk of beyond design-basis accidents is greatly reduced at permanently shutdown and defueled reactors. The staff's analyses in NUREG-1738 concludes that the event sequences important to risk at permanently shutdown and defueled power reactors are limited to large earthquakes and cask drop events. For EP assessments, this is an important difference relative to operating power reactors where typically a large number of different sequences make significant contributions to risk. Per NUREG-1738, relaxation of offsite EP requirements under 10 CFR Part 50 a few months after shutdown resulted in only a small change in risk. The report further concludes that the change in risk due to relaxation of offsite EP requirements is small because the overall risk is low, and because even under current EP requirements for operating power reactors, EP was judged to have marginal impact on evacuation effectiveness in the severe earthquakes that dominate SFP risk. All other sequences including cask drops (for which offsite radiological emergency plans are expected to be more effective) are too low in likelihood to have a significant impact on risk.

Therefore, granting exemptions eliminating the requirements of 10 CFR 50 to maintain offsite radiological emergency plans and reducing the scope of onsite emergency planning activities will not present an undue risk to the public health and safety.

C. Consistent with the Common Defense and Security

The requested exemptions by DEK only involve EP requirements under 10 CFR Part 50 and will allow DEK to revise the KPS Emergency Plan to reflect the permanently shutdown and defueled condition of the facility. Physical security measures at KPS are not affected by the requested EP exemptions. The discontinuation of offsite radiological emergency plans and the reduction in scope of the onsite emergency planning activities at KPS will not adversely affect

DEK's ability to physically secure the site or protect special nuclear material. Therefore, the proposed exemptions are consistent with the common defense and security.

D. Special Circumstances

Special circumstances, in accordance with 10 CFR 50.12(a)(2)(ii), are present whenever application of the regulation in the particular circumstances is not necessary to achieve the underlying purpose of the rule. The underlying purpose of 10 CFR 50.47(b), 10 CFR 50.47(c)(2), and 10 CFR 50, Appendix E, Section IV, is to provide reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency, to establish plume exposure and ingestion pathway emergency planning zones for nuclear power plants, and to ensure that licensees maintain effective offsite and onsite radiological emergency plans. The standards and requirements in these regulations were developed by considering the risks associated with operation of a power reactor at its licensed full-power level. These risks include the potential for a reactor accident with offsite radiological dose consequences.

As discussed previously, because KPS is permanently shutdown and defueled, there is no longer a risk of offsite radiological release from a design-basis accident and the risk of a significant offsite radiological release from a beyond design-basis accident is greatly reduced when compared to an operating power reactor. The NRC staff has confirmed the reduced risks at KPS by comparing the generic risk assumptions in the analyses in NUREG-1738 to site specific conditions at KPS and determined that the risk values in NUREG-1738 bound the risks presented by KPS. Furthermore, the staff has recently concluded in NUREG-2161, "Consequence Study of a Beyond-Design-Basis Earthquake Affecting the Spent Fuel Pool for a U.S. Mark I Boiling Water Reactor," dated September 2014 (ADAMS Accession No. ML14255A365), that, consistent with earlier research studies, SFPs are robust structures that are likely to withstand severe earthquakes without leaking cooling water and potentially

uncovering the spent fuel. The NUREG-2161 study shows the likelihood of a radiological release from the spent fuel after the analyzed severe earthquake at the reference plant to be about one time in 10 million years or lower.

The licensee has analyzed site-specific beyond design-basis accidents to determine the risk of a significant offsite radiological release. In one such analysis, DEK determined that if all the normal cooling systems used to cool the SFP were lost and not restored for the duration of the postulated accident, then as of September 20, 2014, the SFP at the KPS would take 120 hours before it would begin to boil and, due to the loss of SFP water level from the resulting boil off, it would take 26 days for the water inventory to lower to a level of three feet from the top of the fuel. Additionally, DEK analysis shows that as of October 30, 2014, in the event of a complete SFP drain down due to a loss of water inventory, assuming natural circulation of air through the spent fuel racks was available, then the peak fuel clad temperature would remain below 1049°F (565°C), the temperature at which incipient cladding failure may occur. Therefore, in this postulated accident, fuel cladding remains intact and an offsite radiological release would not take place.

The only beyond design-basis accident analysis that reached a condition where a significant offsite release might occur involved a scenario where the SFP drained in such a way that all modes of cooling or heat transfer are assumed to be unavailable. This results in an adiabatic heat-up of the spent fuel. DEK analysis of this beyond design-basis accident shows that as of October 21, 2014, a minimum of 10 hours would be available between the time the fuel is uncovered (at which time adiabatic heat-up begins), until the fuel cladding reaches a temperature of 1652°F (900°C), the temperature associated with rapid cladding oxidation and the potential for a significant radiological release.

Exemptions from the offsite EP requirements in 10 CFR 50 have previously been approved by the NRC when the site-specific analyses show that at least 10 hours is available

following a loss of SFP coolant inventory accident with no air cooling (or other methods of removing decay heat) until cladding of the hottest fuel assembly reaches the zirconium rapid oxidation temperature. The staff concluded in its previously granted exemptions, as it does with the DEK requested EP exemptions, that if a minimum of 10 hours is available to initiate mitigative actions consistent with plant conditions, or if needed, for offsite authorities to implement protective actions using a CEMP approach, then offsite radiological emergency plans, required under 10 CFR Part 50, are not necessary at permanently shutdown and defueled power reactor licensees.

Additionally, DEK committed to enhanced SFP makeup strategies in its letter to the NRC dated August 23, 2014 (ADAMS Accession No. ML13242A019). The multiple strategies for providing makeup to the SFP include: using existing plant systems for inventory makeup; supplying water through hoses to a spool piece connection to the existing SFP piping; or using a diesel-driven portable pump to take suction from Lake Michigan and provide makeup or spray to the SFP. These strategies will continue to be required as a license condition. DEK further provides that the equipment needed to perform these actions will continue to be located onsite, and that the external makeup strategy (using a diesel driven portable pump) is capable of being deployed within 2 hours. Considering the very low probability of beyond design-basis accidents affecting the SFP, these diverse strategies provide defense-in-depth and time to provide makeup or spray to the SFP before the onset of any postulated offsite radiological release.

For all the reasons stated above, the staff finds that the licensee's requested exemptions to meet the underlying purpose of all of the standards in 10 CFR 50.47(b), and requirements in 10 CFR 50.47(c)(2) and Appendix E, acceptably satisfy the special circumstances in 10 CFR 50.12(a)(2)(ii) in view of the greatly reduced risk of offsite radiological consequences associated with the permanently shutdown and defueled state of the KPS facility.

The NRC staff has concluded that the exemptions being granted by this action will maintain an acceptable level of emergency preparedness at KPS and, if needed, that there is reasonable assurance that adequate offsite protective measures can and will be taken by State and local government agencies using a CEMP approach in the event of a radiological emergency at the KPS facility. Since the underlying purposes of the rules, as exempted, would continue to be achieved, even with the elimination of the requirements under 10 CFR Part 50 to maintain offsite radiological emergency plans and reduction in the scope of the onsite emergency planning activities at KPS, the special circumstances required by 10 CFR 50.12(a)(2)(ii) exist.

E. Environmental Considerations

In accordance with 10 CFR 51.31(a), the Commission has determined that the granting of this exemption will not have a significant effect on the quality of the human environment as discussed in the NRC staff's Finding of No Significant Impact and associated Environmental Assessment published October 07, 2014 (79 FR 60513).

IV. Conclusions.

Accordingly, the Commission has determined, pursuant to 10 CFR 50.12(a), that DEK's request for exemptions from certain EP requirements in 10 CFR 50.47(b), 10 CFR 50.47(c)(2), and 10 CFR 50, Appendix E, Section IV, and as summarized in the table at the end of this document, are authorized by law, will not present an undue risk to the public health and safety, and are consistent with the common defense and security. Also, special circumstances are present. Therefore, the Commission hereby grants DEK exemptions from certain EP requirements of 10 CFR 50.47(b), 10 CFR 50.47(c)(2), and 10 CFR 50, Appendix E, Section IV,

as discussed and evaluated in detail in the staff's safety evaluation dated October 27, 2014.

The exemptions are effective as of October 30, 2014.

Dated at Rockville, Maryland, this 27th day of October, 2014.

For the Nuclear Regulatory Commission.

A handwritten signature in cursive script that reads "Michele G. Evans".

Michele G. Evans, Director
Division of Operating Reactor Licensing,
Office of Nuclear Reactor Regulation.

Table of Exemptions Granted to DEK

10 CFR 50.47	NRC Staff Basis for Exemption
<p data-bbox="196 331 423 363">10 CFR 50.47 (b)</p> <p data-bbox="196 399 716 531">The NRC is granting exemption from portions of the rule language that would otherwise require offsite emergency response plans.</p>	<p data-bbox="773 331 1414 699">In the Statement of Considerations (SOC) for the final rule for emergency planning (EP) requirements for independent spent fuel storage installations (ISFSIs) and for monitor retrievable storage installations (MRS) (60 <i>Federal Register</i> (FR) 32430; June 22, 1995), the Commission responded to comments concerning offsite EP for ISFSIs or an MRS and concluded that, "the offsite consequences of potential accidents at an ISFSI or a MRS would not warrant establishing Emergency Planning Zones [EPZ]."</p> <p data-bbox="773 735 1406 1896">In a nuclear power reactor's permanently defueled state, the accident risks are more similar to an ISFSI or MRS than an operating nuclear power plant. The EP program would be similar to that required for an ISFSI under Section 72.32(a) of Title 10 of the <i>Code of Federal Regulations</i> (10 CFR) when fuel stored in the spent fuel pool (SFP) has more than 5 years of decay time and would not change substantially when all the fuel is transferred from the SFP to an onsite ISFSI. Exemptions from offsite EP requirements have previously been approved when the site-specific analyses show that at least 10 hours is available from a partial drain-down event where cooling of the spent fuel is not effective until the hottest fuel assembly reaches 900°C. The technical basis that underlied the approval of the exemption request is based partly on the analysis of a time period that spent fuel stored in the SFP is unlikely to reach the zirconium ignition temperature in less than 10 hours. This time period is based on a heat-up calculation which uses several simplifying assumptions. Some of these assumptions are conservative (adiabatic conditions), while others are non-conservative (no oxidation below 900°C). Weighing the conservatisms and non-conservatisms, the NRC staff judges that this calculation reasonably represents conditions which may occur in the event of an SFP accident. The staff concluded that if 10 hours were available to initiate mitigative actions, or if needed, offsite protective actions using a comprehensive emergency management plan (CEMP), formal offsite</p>

10 CFR 50.47	NRC Staff Basis for Exemption
	<p>radiological emergency plans are not necessary for these permanently defueled nuclear power reactor licensees.</p> <p>As supported by the licensee's SFP analysis, the NRC staff believes an exemption to the requirements for formal offsite radiological emergency plans is justified for a zirconium fire scenario considering the low likelihood of this event together with time available to take mitigative or protective actions between the initiating event and before the onset of a postulated fire.</p> <p>The Dominion Energy Kewaunee, Inc. (DEK) analysis has demonstrated that 90 days after shutdown, the radiological consequences of design-basis accidents will not exceed the limits of the U.S. Environmental Protection Agency's (EPA) Protective Action Guidelines (PAGs) at the exclusion area boundary. These analyses also show that after the spent fuel has decayed for 17 months, for beyond-design-basis events where the SFP is drained, air cooling will prevent the fuel from reaching the lowest temperature where incipient cladding failure may occur (565°C). In the event that air cooling is not possible, 10 hours is available to take mitigative or, if needed, offsite protective actions using a CEMP from the time the fuel is uncovered until it reaches the auto-ignition temperature of 900°C.</p> <p>DEK has also furnished information on its SFP inventory makeup strategies for mitigating the loss of water inventory. The multiple strategies for providing makeup to the SFP include: using existing plant systems for inventory makeup; supplying water via hoses to a spool piece connection to the existing SFP piping; or using a diesel-driven portable pump to take suction from Lake Michigan and provide makeup or spray to the SFP. DEK also stated that the tools and equipment needed to perform these actions are located on site and that the external makeup strategy (using a diesel driven portable pump) was able to be deployed within 2 hours. DEK believes these diverse strategies provide defense-in-depth and ample time to provide makeup or spray to the SFP prior to the onset of zirconium cladding ignition when considering</p>

10 CFR 50.47	NRC Staff Basis for Exemption
	very low probability of beyond design-basis events affecting the SFP.
<p>10 CFR 50.47 (b) (1)</p> <p>The NRC is granting exemption from portions of the rule language that would otherwise require the need for Emergency Planning Zones (EPZs).</p>	<p>Refer to basis for 10 CFR 50.47(b).</p>
<p>10 CFR 50.47 (b) (3)</p> <p>The NRC is granting exemption from portions of the rule language that would otherwise require the need for an Emergency Operations Facility.</p>	<p>Decommissioning power reactors present a low likelihood of any credible accident resulting in a radiological release together with the time available to take mitigative or, if needed, offsite protective actions using a CEMP between the initiating event and before the onset of a postulated fire. As such, an emergency operations facility would not be required. The "nuclear island," control room, or other onsite location can provide for the communication and coordination with offsite organizations for the level of support required.</p> <p>Also refer to basis for 10 CFR 50.47(b).</p>
<p>10 CFR 50.47(b)(4)</p> <p>The NRC is granting exemption from portions of the rule language that would otherwise require reference to formal offsite radiological emergency response plans.</p>	<p>Decommissioning power reactors present a low likelihood of any credible accident resulting in a radiological release together with the time available to take mitigative or if needed, offsite protective actions using a CEMP between the initiating event and before the onset of a postulated fire. As such, formal offsite radiological emergency response plans are not required.</p> <p>The Nuclear Energy Institute (NEI) document NEI 99-01, "Development of Emergency Action Levels for Non-Passive Reactors" (Revision 6), was found to be an acceptable method for development of emergency action levels (EALs) and was endorsed by the U.S. Nuclear Regulatory Commission (NRC) in a letter dated March 28, 2013 (ADAMS Accession No. ML12346A463). NEI 99-01 provides EALs for non-passive operating nuclear power reactors, permanently defueled reactors, and ISFSIs.</p> <p>Also refer to basis for 10 CFR 50.47(b).</p>

10 CFR 50.47	NRC Staff Basis for Exemption
<p>10 CFR 50.47(b)(5)</p> <p>The NRC is granting exemption from portions of the rule language that would otherwise require early notification of the public and a means to provide instructions to the public within the plume exposure pathway Emergency Planning Zone.</p>	<p>Refer to basis for 10 CFR 50.47(b).</p>
<p>10 CFR 50.47(b)(6)</p> <p>The NRC is granting exemption from portions of the rule language that would otherwise require prompt communications with the public.</p>	<p>Refer to basis for 10 CFR 50.47(b).</p>
<p>10 CFR 50.47(b)(7)</p> <p>The NRC is granting exemption from portions of the rule language that would otherwise require information to be made available to the public on a periodic basis about how they will be notified and what their initial protective actions should be.</p>	<p>Refer to basis for 10 CFR 50.47(b).</p>
<p>10 CFR 50.47(b)(9)</p> <p>The NRC is granting exemption from portions of the rule language that would otherwise require the capability for monitoring offsite consequences.</p>	<p>Refer to basis for 10 CFR 50.47(b).</p>
<p>10 CFR 50.47(b)(10)</p> <p>The NRC is granting exemption from portions of the rule language that would reduce the range of protective actions developed for emergency workers and the public. Consideration of evacuation, sheltering, or the use of potassium iodide will no longer be necessary. Evacuation times will no longer need to be developed or updated. Protective actions for the ingestion exposure pathway EPZ will not need to be developed.</p>	<p>In the unlikely event of an SFP accident, the iodine isotopes, which contribute to an off-site dose from an operating reactor accident, are not present, so potassium iodide distribution would no longer serve as an effective or necessary supplemental protective action.</p> <p>The Commission responded to comments in its SOC for the final rule for emergency planning requirements for ISFSIs and MRS facilities (60 FR 32435), and concluded that, "the offsite consequences of potential accidents at an ISFSI or an MRS would not warrant establishing Emergency Planning Zones." Additionally, in the SOC for the final rule for EP requirements for</p>

10 CFR 50.47	NRC Staff Basis for Exemption
	<p>ISFSIs and for MRS facilities (60 FR 32430), the Commission responded to comments concerning site-specific EP that includes evacuation of surrounding population for an ISFSI not at a reactor site, and concluded that, "The Commission does not agree that as a general matter emergency plans for an ISFSI must include evacuation planning."</p> <p>Also refer to basis for 10 CFR 50.47(b).</p>
<p>10 CFR 50.47(c)(2)</p> <p>The NRC is granting exemption from portions of the rule language that would otherwise require the establishment of a 10 mile radius plume exposure pathway EPZ and a 50 mile radius ingestion pathway EPZ.</p>	<p>Refer to basis for 10 CFR 50.47(b)(10).</p>

10 CFR Part 50, Appendix E, Section IV	NRC Staff Basis for Exemption
<p>10 CFR Part 50, App. E, Section IV 1.</p> <p>The NRC is granting exemption from portions of the rule language that would otherwise require onsite protective actions during hostile action.</p>	<p>The EP Rule published in the <i>Federal Register</i> (76 FR 72560; November 23, 2011) amended certain requirements in 10 CFR Part 50. Among the changes, the definition of "hostile action" was added as an act directed toward a nuclear power plant or its personnel. This definition is based on the definition of "hostile action" provided in NRC Bulletin 2005-02, "Emergency Preparedness and Response Actions for Security-Based Events." NRC Bulletin 2005-02 was not applicable to nuclear power reactors that have permanently ceased operations and have certified that fuel has been removed from the reactor vessel.</p> <p>The NRC excluded non-power reactors from the scope of "hostile action" at the time of the rulemaking because, as defined in 10 CFR 50.2, a non-power reactor is not considered a nuclear power reactor and a regulatory basis had not been developed to support the inclusion of non-power reactors within the scope of "hostile action." Similarly, a decommissioning power reactor or an ISFSI is not a "nuclear reactor" as defined in 10 CFR Part 50. A decommissioning power reactor also has a low likelihood of a credible accident resulting in radiological releases requiring offsite protective measures.</p>

10 CFR Part 50, Appendix E, Section IV	NRC Staff Basis for Exemption
	<p>For all of these reasons, the staff concludes that a decommissioning power reactor is not a facility that falls within the scope of "hostile action."</p> <p>Similarly, for security, risk insights can be used to determine which targets are important to protect against sabotage. A level of security commensurate with the consequences of a sabotage event is required and is evaluated on a site-specific basis. The severity of the consequences declines as fuel ages and, thereby, removes over time the underlying concern that a sabotage attack could cause offsite radiological consequences.</p> <p>Although, this analysis provides a justification for exempting KPS from "hostile action" related requirements, some EP requirements for security-based events are maintained. The classification of security-based events, notification of offsite authorities and coordination with offsite agencies under a CEMP concept are still required.</p>
<p>10 CFR Part 50, App. E, Section IV 2.</p> <p>The NRC is granting exemption from portions of the rule language concerning the evacuation time analyses within the plume exposure pathway EPZ for the licensee's initial application.</p>	<p>Refer to basis for 10 CFR 50.47(b)(10).</p>
<p>10 CFR Part 50, App. E, Section IV 3.</p> <p>The NRC is granting exemption from portions of the rule language that would otherwise require use of NRC-approved evacuation time estimates (ETEs) and updates to State and local governments when developing protective action strategies.</p>	<p>Refer to basis for 10 CFR Part 50, Appendix E, Section IV.2.</p>
<p>10 CFR Part 50, App. E, Section IV 4</p> <p>The NRC is granting exemption from portions of the rule language that would otherwise require licensees to develop evacuation time estimates based on the most recent census data and submit the</p>	<p>Refer to basis for 10 CFR Part 50, Appendix E, Section IV.2.</p>

10 CFR Part 50, Appendix E, Section IV	NRC Staff Basis for Exemption
ETE analysis to the NRC prior to providing it to State and local government for developing protective action strategies.	
<p>10 CFR Part 50, App. E, Section IV 5.</p> <p>The NRC is granting exemption from portions of the rule language that would otherwise require licensees to estimate the EPZ permanent resident population changes once a year between decennial censuses.</p>	Refer to basis for 10 CFR Part 50, Appendix E, Section IV.2.
<p>10 CFR Part 50, App. E, Section IV 6.</p> <p>The NRC is granting exemption from portions of the rule language that would otherwise require the licensee to submit an updated ETE analysis to the NRC based on changes in the resident population that result in exceeding specific evacuation time increase criteria.</p>	Refer to basis for 10 CFR Part 50, Appendix E, Section IV.2.
<p>10 CFR Part 50, App. E, Section IV A.1.</p> <p>The NRC is granting exemption from the word "operating" in the requirement to describe the normal plant organization.</p>	Based on the permanently shutdown and defueled status of the reactor, a decommissioning reactor is not authorized to operate under 10 CFR 50.82(a). Because the licensee cannot operate the reactors, the licensee does not have a "plant operating organization."
<p>10 CFR Part 50, App. E, Section IV A.3.</p> <p>The NRC is granting exemption to the requirement to describe the licensee's headquarters personnel sent to the site to augment the onsite emergency response organization.</p>	The number of staff at decommissioning sites is generally small but is commensurate with the need to safely store spent fuel at the facility in a manner that is protective of public health and safety. Decommissioning sites typically have a level of emergency response that does not require response by the licensee's headquarters personnel.
<p>10 CFR Part 50, App. E, Section IV A. 4.</p> <p>The NRC is granting exemption from portions of the rule language that would otherwise require the licensee to identify a position and function within its organization which will carry the responsibility for making offsite dose</p>	Although, the likelihood of events that would result in doses in excess of the EPA PAGs to the public beyond the owner controlled area boundary based on the permanently shutdown and defueled status of the reactor is extremely low, the licensee still must be able to determine if a radiological release is occurring. If a release is occurring, then the licensee staff should promptly

10 CFR Part 50, Appendix E, Section IV	NRC Staff Basis for Exemption
projections.	communicate that information to offsite authorities for their consideration. The offsite organizations are responsible for deciding what, if any, protective actions should be taken based on comprehensive emergency planning.
<p>10 CFR Part 50, App. E, Section IV A. 5.</p> <p>The NRC is granting exemption from the requirement for the licensee to identify individuals with special qualifications for coping with emergencies.</p>	<p>The number of staff at decommissioning sites is generally small but should be commensurate with the need to operate the facility in a manner that is protective of public health and safety.</p>
<p>10 CFR Part 50, App. E, Section IV A.7.</p> <p>The NRC is granting exemption from portions of the rule language that would otherwise require a description of the assistance expected from State, local, and Federal agencies for coping with a hostile action.</p>	<p>Refer to basis for 10 CFR Part 50, Appendix E, Section IV.1.</p>
<p>10 CFR Part 50, App. E, Section IV A.8.</p> <p>The NRC is granting exemption from the requirement to identify the State and local officials for ordering protective actions and evacuations.</p>	<p>Offsite emergency measures are limited to support provided by local police, fire departments, and ambulance and hospital services, as appropriate. Due to the low probability of design basis accidents or other credible events to exceed the EPA PAGs, protective actions such as evacuation should not be required, but could be implemented at the discretion of offsite authorities using a CEMP.</p> <p>Also refer to basis for 10 CFR 50.47(b)(10).</p>

10 CFR Part 50, Appendix E, Section IV	NRC Staff Basis for Exemption
<p data-bbox="180 226 760 262">10 CFR Part 50, App. E, Section IV A.9.</p> <p data-bbox="180 296 760 527">The NRC is granting exemption from the requirement for the licensee to provide an analysis demonstrating that on-shift personnel are not assigned responsibilities that would prevent them from performing their assigned emergency plan functions.</p>	<p data-bbox="760 226 1427 495">Responsibilities should be well defined in the emergency plan and procedures, regularly tested through drills and exercises audited and inspected by the licensee and the NRC. The duties of the onshift personnel at a decommissioning reactor facility are not as complicated and diverse as those for an operating power reactor.</p> <p data-bbox="760 529 1427 999">The NRC staff considered the similarity between the staffing levels at a permanently shutdown and defueled reactor and staffing levels at an operating power reactor site. The minimal systems and equipment needed to maintain the spent nuclear fuel in the SFP or in a dry cask storage system in a safe condition requires minimal personnel and is governed by Technical Specifications. In the EP final rule published in the <i>Federal Register</i> (76 FR 72560; November 23, 2011), the NRC concluded that the staffing analysis requirement was not necessary for non-power reactor licensees due to the small staffing levels required to operate the facility.</p> <p data-bbox="760 1033 1427 1902">The NRC staff also examined the actions required to mitigate the very low probability beyond design-basis events for the SFP. Additionally, DEK also furnished information on its SFP inventory makeup strategies for mitigating the loss of water inventory. The multiple strategies for providing makeup to the SFP include: using existing plant systems for inventory makeup; supplying water via hoses to a spool piece connection to the existing SFP piping; or using a diesel-driven portable pump to take suction from Lake Michigan and provide makeup or spray to the SFP. DEK further provided that the tools and equipment needed to perform these actions are located on site and the external makeup strategy (using a diesel driven portable pump) was demonstrated to be capable of being deployed within 2 hours, significantly less time than the 10 hours that would be available for ad hoc response. DEK believes, and the NRC staff agrees, that these diverse strategies provide defense-in-depth and ample time to provide makeup or spray to the SFP prior to the onset of zirconium cladding ignition when considering very low probability beyond design-basis events affecting the SFP.</p>

10 CFR Part 50, Appendix E, Section IV	NRC Staff Basis for Exemption
<p>10 CFR Part 50, App. E, Section IV B.1.</p> <p>The NRC is granting exemption from portions of the rule language that would otherwise require offsite emergency actions levels and offsite protective measures and associate offsite monitoring for the emergency conditions.</p> <p>In addition, the NRC is granting exemption from portions of the rule language that would otherwise require emergency action levels based on hostile action.</p>	<p>NEI 99-01, "Development of Emergency Action levels for Non-Passive Reactors" (Revision 6), was found to be an acceptable method for development of EALs and was endorsed by the NRC in a letter dated March 28, 2013 (ADAMS Accession No. ML12346A463). No offsite protective actions are anticipated to be necessary, so classification above the alert level is no longer required, which is consistent with ISFSI facilities.</p> <p>Also refer to basis for 10 CFR Part 50, Appendix E, Section IV.1.</p>
<p>10 CFR Part 50, App. E, Section IV C.1.</p> <p>The NRC is granting exemption from portions of the rule language that would otherwise require emergency actions levels based on operating reactor concerns, such as offsite radiation monitoring, pressure in containment, and the response of the emergency core cooling system. In addition, the NRC is striking language that would otherwise require offsite emergency action levels of a site area emergency and a general emergency.</p>	<p>Containment parameters do not provide an indication of the conditions at a defueled facility and emergency core cooling systems are no longer required. Other indications, such as SFP level or temperature, can be used at sites where there is spent fuel in the SFPs.</p> <p>In the SOC for the final rule for EP requirements for ISFSIs and MRS)facilities (60 FR 32430), the Commission responded to comments concerning a general emergency at an ISFSI and an MRS, and concluded that, "...an essential element of a General Emergency is that a release can be reasonably expected to exceed EPA Protective Action Guidelines exposure levels off site for more than the immediate site area."</p> <p>The probability of a condition reaching the level above an emergency classification of alert is very low. In the event of an accident at a defueled facility that meets the conditions for relaxation of EP requirements, there will be available time for event mitigation and, if necessary, implementation of offsite protective actions using a CEMP.</p> <p>NEI 99-01, "Development of Emergency Action levels for Non-Passive Reactors," (Revision 6) was found to be an acceptable method for development of EALs and was endorsed by the NRC in a letter dated March 28, 2013 (ADAMS Accession No. ML12346A463). No offsite protective actions are anticipated to be necessary, so classification above the alert level is no longer required.</p>

10 CFR Part 50, Appendix E, Section IV	NRC Staff Basis for Exemption
<p>10 CFR Part 50, App. E, Section IV C.2.</p> <p>The NRC is granting exemption from portions of the rule language that would otherwise require the licensee to assess, classify, and declare an emergency condition within 15 minutes.</p>	<p>In the EP rule published in the <i>Federal Register</i> (76 FR 72560), non-power reactor licensees were not required to assess, classify and declare an emergency condition within 15 minutes. An SFP and an ISFSI are also not nuclear power reactors as defined in the NRC's regulations. A decommissioning power reactor has a low likelihood of a credible accident resulting in radiological releases requiring offsite protective measures. For these reasons, the NRC staff concludes that a decommissioning power reactor should not be required to assess, classify and declare an emergency condition within 15 minutes.</p>
<p>10 CFR Part 50, App. E, Section IV D.1.</p> <p>The NRC is granting exemption from portions of the rule language that would otherwise require the licensee to reach agreement with local, State, and Federal officials and agencies for prompt notification of protective measures or evacuations and the associated titles of officials to be notified for each agency within the EPZs.</p>	<p>Refer to basis for 10 CFR 50.47(b) and 10 CFR 50.47(b)(10).</p>
<p>10 CFR Part 50, App. E, Section IV D.2.</p> <p>The NRC is granting exemption from the requirement for the licensee to annually disseminate general information on emergency planning and evacuations within the plume exposure pathway EPZ. The need for signage or other measure to address transient populations is also being struck.</p>	<p>Refer to basis for 10 CFR Part 50, Appendix E, Section IV.D.1.</p>
<p>10 CFR Part 50, App. E, Section IV D.3.</p> <p>The NRC is granting exemption from portions of the rule language that would otherwise require the licensee to have the capability to make notifications to State and local government agencies within 15 minutes of declaring an emergency.</p>	<p>While the capability needs to exist for the notification of offsite government agencies within a specified time period, previous exemptions have allowed for extending the State and local government agencies' notification time up to 60 minutes based on the site-specific justification provided.</p> <p>DEK's exemption request provides that the KPS will make notifications to the State of Wisconsin, to the local county (Kewaunee) and the NRC</p>

10 CFR Part 50, Appendix E, Section IV	NRC Staff Basis for Exemption
	<p>within 60 minutes of declaration of an event. In the permanently defueled condition of the reactor, the rapidly developing scenarios associated with events initiated during reactor power operation are no longer credible.</p> <p>Also refer to basis for 10 CFR 50.47(b) and 10 CFR 50.47(b)(10).</p>
<p>10 CFR Part 50, App. E, Section IV D.4.</p> <p>The NRC is granting exemption from the requirement for the licensee to obtain FEMA approval of its backup alert and notification capability.</p>	<p>Refer to basis for 10 CFR Part 50, Appendix E, Section IV.D.3 regarding the alert and notification system requirements.</p>
<p>10 CFR Part 50, App. E, Section IV E.8.a.(i)</p> <p>The NRC is granting exemption from portions of the rule language that would otherwise require the licensee to have an onsite technical support center and emergency operations facility.</p>	<p>Due to the low probability of design-basis accidents or other credible events to exceed the EPA PAGs at the site boundary, the available time for event mitigation at a decommissioning reactor and, if needed, to implement offsite protective actions using a CEMP, an emergency operations facility (EOF) would not be required to support offsite agency response. Onsite actions may be directed from the control room or other location, without the requirements imposed on a technical support center (TSC).</p>
<p>10 CFR Part 50, App. E, Section IV E.8.a. (ii)</p> <p>The NRC is granting exemption from portions of the rule language that would otherwise require the licensee to have an onsite operational support center.</p>	<p>NUREG-0696, "Functional Criteria for Emergency Response Facilities," provides that the operational support center (OSC) is an onsite area separate from the control room and the TSC where licensee operations support personnel will assemble in an emergency. For a decommissioning power reactor, an OSC is no longer required to meet its original purpose of an assembly area for plant logistical support during an emergency. The OSC function can be incorporated into another facility.</p>
<p>10 CFR Part 50, App. E, Section IV E.8.b. and subpart Sections IV E.8.b.(1) - E.8.b.(5)</p> <p>The NRC is granting exemption from the requirements related to an offsite emergency operations facility location, space and size, communications capability, access to plant data and</p>	<p>Refer to basis for 10 CFR 50.47(b)(3).</p>

10 CFR Part 50, Appendix E, Section IV	NRC Staff Basis for Exemption
radiological information, and access to coping and office supplies.	
<p>10 CFR Part 50, App. E, Section IV E.8.c. and Sections IV E.8.c.(1) - E.8.c.(3)</p> <p>The NRC is granting exemption from the requirements to have an emergency operations facility with the capabilities to obtain and display plant data and radiological information; the capability to analyze technical information and provide briefings; and the capability to support events occurring at more than one site (if the emergency operations center supports more than one site).</p>	Refer to basis for 10 CFR 50.47(b)(3).
<p>10 CFR Part 50, App. E, Section IV E.8.d</p> <p>The NRC is granting exemption from the requirements to have an alternate facility that would be accessible even if the site is under threat of or experiencing hostile action, to function as a staging area for augmentation of emergency response staff.</p>	Refer to basis for 10 CFR Part 50, Appendix E, Section IV.1 regarding hostile action.
<p>10 CFR Part 50, App. E, Section IV E.8.e.</p> <p>The NRC is granting exemption from the requirement regarding the need for the licensee to comply with paragraph 8.b of this section.</p>	Refer to basis for 10 CFR 50.47(b)(3).
<p>10 CFR Part 50, App. E, Section IV E.9.a.</p> <p>The NRC is granting exemption from portions of the rule language that would otherwise require the licensee to have communications with State and local governments that are within the plume exposure pathway EPZ (which is no longer required by the exemption granted to 10 CFR 50.47(b)(10)) but are not contiguous with or bordering on the licensee site boundary.</p>	<p>Refer to basis for 10 CFR 50.47(b) and 10 CFR 50.47(b)(10).</p> <p>Communications with State and local governments that are not contiguous with or bordering the site boundary will no longer be required. However, the contiguous State and the local governments in which the nuclear facility is located will still need to be informed of events and emergencies, so lines of communication must be maintained.</p>
10 CFR Part 50, App. E, Section IV E.9.c.	Because of the low probability of design-basis accidents or other credible events that would be

10 CFR Part 50, Appendix E, Section IV	NRC Staff Basis for Exemption
<p>The NRC is granting exemption from the requirements for communication and testing provisions between the control room, the onsite technical support center, State/local emergency operations facilities, and field assessment teams.</p>	<p>expected to exceed the EPA PAGs and the available time for event mitigation and, if needed, implementation of offsite protective actions using a CEMP, there is no need for the TSC, EOF, or offsite field assessment teams.</p> <p>Also refer to justification for 10 CFR 50.47(b)(3). Communication with State and local emergency operation centers is maintained to coordinate assistance on site if required.</p>
<p>10 CFR Part 50, App. E, Section IV E.9.d.</p> <p>The NRC is granting exemption from portions of the rule language that would otherwise require provisions for communications from the control room, onsite technical support center, and emergency operations facility with NRC Headquarters and appropriate Regional Operations Center.</p>	<p>The functions of the control room, EOF, TSC, and OSC may be combined into one or more locations due to the smaller facility staff and the greatly reduced required interaction with State and local emergency response facilities.</p> <p>Also refer to basis for 10 CFR 50.47(b).</p>
<p>10 CFR Part 50, App. E, Section IV F.1. and Section IV F.1. v.iii</p> <p>The NRC is granting exemption from portions of the rule language that would otherwise require the licensee to provide training and drills for the licensee's headquarters personnel, Civil Defense personnel, or local news media.</p>	<p>Decommissioning power reactor sites typically have a level of emergency response that does not require additional response by the licensee's headquarters personnel, Civil Defense personnel, or local news media. Therefore, the NRC staff considers it reasonable to exempt the licensee from training and drill requirements for these personnel.</p>
<p>10 CFR Part 50, App. E, Section IV F.2.</p> <p>The NRC is granting exemption from portions of the rule language that would otherwise require testing of a public alert and notification system.</p>	<p>Because of the low probability of design basis accidents or other credible events that would be expected to exceed the limits of EPA PAGs and the available time for event mitigation and offsite protective actions from a CEMP, the public alert and notification system will not be used and, therefore, requires no testing.</p> <p>Also refer to basis for 10 CFR 50.47(b).</p>
<p>10 CFR Part 50, App. E, Section IV F.2.a. and Section IV F.2.a.(i) through IV F.2.a.(iii)</p> <p>The NRC is granting exemption from the requirements for full participation exercises and the submittal of the associated exercise scenarios to the NRC.</p>	<p>Due to the low probability of design basis accidents or other credible events that would be expected to exceed the limits of EPA PAGs, the available time for event mitigation and, if necessary, implementation of offsite protective actions using a CEMP, no formal offsite radiological emergency plans are required.</p> <p>The intent of submitting exercise scenarios at an</p>

10 CFR Part 50, Appendix E, Section IV	NRC Staff Basis for Exemption
	<p>operating power reactor site is to ensure that licensees utilize different scenarios in order to prevent the preconditioning of responders at power reactors. For decommissioning power reactor sites, there are limited events that could occur, and as such, the previously routine progression to general emergency in an operating power reactor site scenario is not applicable.</p> <p>The licensee would be exempt from 10 CFR Part 50, Appendix E, Section IV.F.2.a.(i)-(iii) because the licensee would be exempt from the umbrella provision of 10 CFR Part 50, Appendix E, Section IV.F.2.a.</p>
<p>10 CFR Part 50, App. E, Section IV F.2.b.</p> <p>The NRC is granting exemption from portions of the rule language that would otherwise require the licensee to submit scenarios for its biennial exercises of its onsite emergency plan. In addition, the NRC is granting exemption from portions of the rule language that requires assessment of offsite releases, protective action decision making, and reference to the Technical Support Center, Operations Support Center, and the Emergency Operations Facility.</p>	<p>Refer to basis for 10 CFR Part 50, Appendix E, Section IV.F.2.a.</p> <p>The low probability of design basis accidents or other credible events that would exceed the EPA PAGs, the available time for event mitigation and, if necessary, implementation of offsite protective actions using a CEMP, render a TSC, OSC and EOF unnecessary. The principal functions required by regulation can be performed at an onsite location that does not meet the requirements of the TSC, OSC or EOF.</p>
<p>10 CFR Part 50, App. E, Section IV F.2.c. and Sections IV F.2.c.(1) through F.2.c.(5)</p> <p>The NRC is granting exemption from the requirements regarding the need for the licensee to exercise offsite plans biennially with full participation by each offsite authority having a role under the radiological response plan. The NRC is also granting exemptions from the conditions for conducting these exercises (including hostile action exercises) if two different licensees have facilities on the same site or on adjacent, contiguous sites, or share most of the elements defining co-located licensees.</p>	<p>Refer to basis for 10 CFR Part 50, Appendix E, Section IV.F.2.a.</p>

10 CFR Part 50, Appendix E, Section IV	NRC Staff Basis for Exemption
<p>10 CFR Part 50, App. E, Section IV F.2.d.</p> <p>The NRC is granting exemption from the requirements to obtain State participation in an ingestion pathway exercise and a hostile action exercise, with each State that has responsibilities, at least once per exercise cycle.</p>	<p>Refer to basis for 10 CFR Part 50, Appendix E, Section IV.2.</p>
<p>10 CFR Part 50, App. E, Section IV F.2.e.</p> <p>The NRC is granting exemption from portions of the rule language that would otherwise require the licensee to allow participation exercise in licensee drills by any State and local Government in the plume exposure pathway EPZ when requested.</p>	<p>Refer to basis for 10 CFR Part 50, Appendix E, Section IV.2.</p>
<p>10 CFR Part 50, App. E, Section IV F.2.f.</p> <p>The NRC is granting exemption from portions of the rule language that would otherwise require FEMA to consult with the NRC on remedial exercises. The NRC is granting exemption from portions of the rule language that discuss the extent of State and local participation in remedial exercises.</p>	<p>The U.S. Federal Emergency Management Agency is responsible for evaluating the adequacy of offsite response during an exercise. No action is expected from State or local government organizations in response to an event at a decommissioning power reactor site other than onsite firefighting, law enforcement and ambulance/medical services support. A memorandum of understanding should be in place for those services. Offsite response organizations will continue to take actions on a comprehensive emergency planning basis to protect the health and safety of the public as they would at any other industrial site.</p>
<p>10 CFR Part 50, App. E, Section IV F.2.i.</p> <p>The NRC is granting exemption from portions of the rule language that would otherwise require the licensee to drill and exercise scenarios that include a wide spectrum of radiological release events and hostile action.</p>	<p>Due to the low probability of design basis accidents or other credible events to exceed the EPA PAGs, the available time for event mitigation and, if needed, implementation of offsite protective actions using a CEMP, the previously routine progression to general emergency in power reactor site scenarios is not applicable to a decommissioning site. Therefore, the licensee is not expected to demonstrate response to a wide spectrum of events.</p> <p>Also refer to basis for 10 CFR Part 50, Appendix E, Section IV.1 regarding hostile action.</p>

10 CFR Part 50, Appendix E, Section IV	NRC Staff Basis for Exemption
<p>10 CFR Part 50, App. E, Section IV F.2.j.</p> <p>The NRC is granting exemption from the requirements regarding the need for the licensee's emergency response organization to demonstrate proficiency in key skills in the principal functional areas of emergency response. Additionally, the NRC is granting exemption during an eight calendar year exercise cycle, from demonstrating proficiency in the key skills necessary to respond to such scenarios as hostile actions, unplanned minimal radiological release, § 50.54(hh)(2) implementation strategies, and scenarios involving rapid escalation to a Site Area Emergency or General Emergency.</p>	<p>Refer to basis for 10 CFR Part 50, Appendix E, Section IV.F.2.</p>
<p>10 CFR Part 50, App. E, Section IV I</p> <p>The NRC is granting exemption from the requirements regarding the need for the licensee to develop a range of protective action for onsite personnel during hostile actions.</p>	<p>Refer to basis for 10 CFR Part 50, Appendix E, Section IV.E.8.d.</p>

ENCLOSURE 2

SAFETY EVALUATION RELATED TO
DOMINION ENERGY KEWAUNEE, INC.
REQUEST FOR EXEMPTIONS FROM PORTIONS OF
10 CFR 50.47 AND 10 CFR PART 50, APPENDIX E



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO REQUEST FOR EXEMPTIONS FROM PORTIONS OF

10 CFR 50.47 AND 10 CFR PART 50 APPENDIX E

BY DOMINION ENERGY KEWAUNEE, INC.

DOCKET NO. 50-305

1.0 INTRODUCTION

Kewaunee Power Station (KPS) is a decommissioning power reactor located on approximately 900 acres in Carlton, Wisconsin, 27 miles southeast of Green Bay Wisconsin. Dominion Energy Kewaunee, Inc. (DEK) is the holder of Renewed Facility Operating License No. DPR-43 for KPS, issued pursuant to the Atomic Energy Act of 1954, as amended, and Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50. By letter dated February 25, 2013 (Reference 1), DEK submitted a certification to the U.S. Nuclear Regulatory Commission (NRC or staff) indicating its intention to permanently cease power operations at the KPS on May 7, 2013, pursuant to 10 CFR 50.82(a)(1)(i). On May 7, 2013, DEK permanently shut down KPS. On May 14, 2013, DEK submitted a certification of permanent removal of fuel from the reactor vessel pursuant to 10 CFR 50.82(a)(1)(ii) (Reference 2). Upon docketing of these certifications, the 10 CFR Part 50 license for KPS no longer authorizes operation of the reactor or emplacement or retention of fuel into the reactor vessel, as specified in 10 CFR 50.82(a)(2). DEK is authorized to possess and store spent nuclear fuel at the permanently shutdown and defueled KPS facility. Spent fuel is currently stored on site at KPS in a spent fuel pool (SFP) and a dry cask storage facility.

By letter dated July 31, 2013, "Request for Exemptions from Portions of 10 CFR 50.47 and 10 CFR 50, Appendix E Section IV" (Reference 3), DEK requested exemptions from certain emergency planning (EP) requirements in 10 CFR 50.47, "Emergency plans," and Appendix E, "Emergency Planning and Preparedness for Production and Utilization Facilities," to 10 CFR Part 50 for KPS. More specifically, DEK requested exemptions from certain planning standards in 10 CFR 50.47(b) regarding onsite and offsite emergency response plans for nuclear power reactors; from certain requirements in 10 CFR 50.47(c)(2) that require establishment of plume exposure and ingestion pathway emergency planning zones for nuclear power reactors; and from certain requirements in 10 CFR 50, Appendix E, Section IV, which establishes the elements that make up the content of emergency plans. The DEK requested exemptions eliminate the requirements for offsite radiological emergency plans and reduce the scope of the onsite emergency planning activities at KPS based on the reduced risks of an offsite radiological release at KPS given its permanently shutdown and defueled status. The exemptions will maintain the requirements for an onsite radiological emergency plan and will continue to ensure the capability to communicate and coordinate with offsite response authorities. Examples of the reduced EP requirements include: setting the highest emergency plan classification as an

"Alert"; extending the timing requirements for notification of offsite authorities; requiring only onsite exercises with the opportunity for offsite response organization participation; and only maintaining arrangements for offsite response organizations (i.e., law enforcement, fire and medical services) that may respond to onsite emergencies.

In response to an NRC staff request for additional information, DEK supplemented its original exemption request by a letter dated December 11, 2013 (Reference 4). In a letter dated January 10, 2014, DEK provided additional information (Reference 5) concerning the spent fuel pool makeup strategies discussed in DEK's December 11, 2013, response letter. The staff found the application complete and that the licensee's associated technical justification provides a basis for consideration of the requested exemptions.

In accordance with 10 CFR 50.12, DEK stated that this exemption request: (1) is authorized by law, will not present an undue risk to the public health and safety, and is consistent with the common defense and security; and (2) special circumstances are present as listed in 10 CFR 50.12(a)(2).

1.1 Discussion

The regulations that require each nuclear power reactor licensee to establish and maintain emergency plans and preparedness are set forth in 10 CFR 50.47, and Appendix E to 10 CFR Part 50. The regulations include standards for both onsite and offsite radiological emergency plans. However, when compared to an operating nuclear power plant, the regulations do not take into account that the reduced risk of an offsite radiological release at a permanently shutdown and defueled reactor.

With the termination of reactor operations at KPS and the permanent removal of the fuel from the reactor core, most of the accident scenarios postulated for operating reactors are no longer possible. The irradiated fuel is now stored in either the SFP or the KPS independent spent fuel storage installation (ISFSI) and will remain onsite until it can be moved offsite for long-term storage or disposal. The reactor, reactor coolant system (RCS), and supporting systems are no longer in operation and have no function related to the storage or the irradiated fuel. Therefore postulated accidents involving failure or malfunction of the reactor, RCS, and supporting systems are no longer applicable.

During reactor decommissioning, the principal public safety concerns involve the perceived radiological risks associated with the storage of spent fuel onsite. For a period of time after fuel has been irradiated in a power reactor and is being stored in an SFP, a highly unlikely accident scenario has been postulated where a loss of water inventory from the SFP could result in a significant heat-up of the spent fuel, culminating in substantial zirconium cladding oxidation and fuel damage, also known as a zirconium fire.

In August 1997, the NRC published NUREG/CR-6451, "A Safety and Regulatory Assessment of Generic BWR [*boiling water reactor*] and PWR [*pressurized water reactor*] Permanently Shutdown Nuclear Power Plants" (Reference 6), which provided recommendations on operationally-based regulations that could be partially or totally removed for decommissioning power reactor licensees without impacting public health and safety. It recommended that licensees apply for exemptions from certain EP requirements, after the spent fuel is no longer susceptible to substantial zirconium oxidation and the fuel cladding will remain intact given the SFP is drained.

In the late 1990s, the staff developed a thermal-hydraulic criterion for determining when reductions in EP requirements at decommissioning power reactors could be permitted. The criterion was used on a case-by-case basis to grant exemptions from certain EP requirements. The underlying technical basis was a demonstration that: (1) the radiological consequences of applicable design-basis accidents (DBAs) would not exceed radiological release limits at the site exclusion area boundary; and (2) for a highly unlikely accident where the SFP is drained and no cooling (air or water) of the fuel is taking place, the spent fuel stored in the SFP would not reach the zirconium ignition temperature in fewer than 10 hours starting from the time at which the accident was initiated. The staff concluded that if 10 hours were available to initiate mitigation actions, or if needed, offsite protective actions using a comprehensive emergency management plan¹ (CEMP) approach, then offsite radiological emergency plans would not be necessary for permanently defueled power reactor licensees.

The analysis and 10-hour criterion for mitigating the potential consequences of beyond-design-basis accidents² (DBAs) at a SFP does not credit the natural air cooling and water cooling in the SFP after the event, as a modeling simplification. It assumes that the fuel immediately begins to heat-up without removing any of its energy (often referred to as an adiabatic heat-up). These assumptions include the simplified treatment of the thermal-hydraulic response and the use of often bounding configurations that do not allow for thermal radiation between high powered bundles and low power bundles and from the spent fuel assemblies to the SFP wall liner. In a more realistic calculation, as provided in the recent NUREG-2161 "Consequence Study of a Beyond-Design-Basis Earthquake Affecting the Spent Fuel Pool for a U.S. Mark I Boiling-Water Reactor," dated September 14, 2014 (Reference 7), thermal radiation heat transfer (in addition to air cooling) can play a significant role. For example, it could take more than 10 hours for the fuel to heat up to the zirconium cladding ignition temperature (900°Celsius (C)) after only one month of being moved from the reactor to the SFP, for the reference plant, if the assemblies most recently removed from the reactor are distributed among older, cooler, fuel assemblies. It should be noted that assessment applies to BWR fuel only. Due to the much higher mass and slightly higher burnup of a typical PWR assembly, the time to reach an air-coolable configuration is significantly longer for PWR fuel using similar analytical methods and assumptions.

The 10-hour time frame is not intended to be the time in which it would take to repair all key safety systems or to repair a large SFP breach. Rather considering the very low probability of beyond-DBAs affecting the SFP, in the staff's judgment, 10 hours provides a reasonable time period to implement pre-planned mitigation measures to provide makeup or spray to the SFP before the onset of zirconium cladding ignition and, if necessary, for offsite authorities to implement protective actions using a CEMP approach.

¹ A comprehensive emergency management plan in this context, also referred to as an emergency operations plan (EOP), is addressed in the Federal Emergency Management Agency's (FEMA) Comprehensive Preparedness Guide (CPG) 101, "Developing and Maintaining Emergency Operations Plans". CPG 101 is the foundation for State, territorial, tribal, and local emergency planning in the United States. It promotes a common understanding of the fundamentals of risk-informed planning and decision making and helps planners at all levels of government in their efforts to develop and maintain viable, all-hazards, all-threats emergency plans. An EOP is flexible enough for use in all emergencies. It describes how people and property will be protected; details who is responsible for carrying out specific actions; identifies the personnel, equipment, facilities, supplies and other resources available; and outlines how all actions will be coordinated. A comprehensive emergency management plan is often referred to as a synonym for "all hazards planning."

² Beyond Design-Basis Accidents - This term refers to accident sequences that are possible but unlikely and are considered beyond the scope of design-basis accidents that a nuclear facility must be designed and built to withstand.

In February 2001, the NRC prepared NUREG-1738, "Technical Study of Spent Fuel Pool Accident Risk at Decommissioning Nuclear Power Plants" (Reference 8), to provide a technical basis for potential rulemaking, including EP, for nuclear power reactors that are permanently shutdown and defueled. Although the rulemaking was later deferred in light of higher priority work after the terrorist attacks of September 11, 2001, NUREG-1738 provides insights that the staff continues to find helpful for the evaluation of exemption requests regarding EP requirements.

NUREG-1738 identified a zirconium fire resulting from a substantial loss of water inventory from the SFP as the only postulated scenario at a decommissioning plant that could result in a significant offsite radiological release. The scenarios that lead to this condition have very low probabilities of occurrence and are considered beyond-DBAs but, the consequences of such accidents could lead to an offsite radiological dose in excess of the U.S. Environmental Protection Agency's (EPA's) Protective Action Guidelines (PAGs) at the Exclusion Area Boundary (EAB). However, the risk associated with zirconium cladding fire events decreases as the spent fuel ages, decay time increases, decay heat decreases, and short-lived radionuclides decay away. After a certain amount of time, the overall risk of a zirconium cladding fire becomes extremely low due to two factors: (1) the amount of time available for preventative and mitigating actions; and (2) the increased likelihood that the fuel is air coolable. The NRC staff also notes that the results of research conducted for NUREG-1738 and NUREG-2161 suggest that, while other radiological consequences can be extensive, a postulated accident scenario leading to a SFP zirconium fire, where the fuel has significant decay time, will have little potential to cause offsite early fatalities regardless of the type of offsite EP response.

Although the risk of sabotage is not considered in any standard reactor risk analyses, the staff cannot rule out radiological sabotage (which is not quantifiable) as an insignificant risk contributor relative to other zirconium cladding fire initiators. Therefore, permanently shutdown and defuel reactors must continue to provide a high assurance of adequate protection from the design basis threat of radiological sabotage under the plant's Physical Security Plan. Physical security for special nuclear material at fixed sites, including decommissioning power reactors, is required by 10 CFR Part 73, "Physical Protection of Plants and Materials." Decommissioning power reactor licensees are required by 10 CFR 73.55(f) to develop target sets for use in the development and implementation of security strategies that protect against spent fuel sabotage. When compared to operating power reactors, the number of target sets at a decommissioning reactor is significantly reduced. Implementation of the protective strategy at a decommissioning reactor takes into account this reduction in target sets.

In its submittals supporting the requested EP exemptions, DEK has demonstrated that there are no longer any DBAs at KPS that exceed the limits of the EPA PAGs at the EAB. The postulated DBAs that remain applicable to KPS in the permanently shut down and defueled condition are a fuel handling accident (FHA) in the auxiliary building where the SFP is located, an accidental release of waste liquid, or an accidental release of waste gas. Analyses by DEK show that the only DBA that could result in an offsite radiological release at KPS, would be the FHA. DEK radiological analysis shows that 90 days after KPS permanently shutdown, the radiological consequence of the FHA will not exceed the limits of the EPA PAGs at the EAB.

In support of its application for exemption from certain EP requirements, DEK analyzed a number of beyond-DBAs that could be postulated for KPS. Only two of these accidents had potential for significant offsite radiological release:

1. A complete loss of cooling water inventory in the SFP with air cooling, and,

2. A loss of cooling water inventory in the SFP with no air cooling or other modes of heat removal (adiabatic heat-up).

For a complete loss of cooling water inventory accident in the SFP, DEK performed a quantitative analysis of the heat-up characteristics of the KPS spent fuel that would result when cooling of the spent fuel depends on the natural circulation of air through the spent fuel racks. The results of this DEK analysis concluded that a minimum decay time to preclude fuel damage, if the SFP is completely drained, is approximately 17 months (which will occur on October 30, 2014). Specifically, as of October 30, 2014, decay heat cannot raise the spent fuel cladding temperature sufficiently to cause damage to the cladding (565°C) if all water is drained from the SFP. Since fuel cladding would remain intact at this temperature, a complete loss of water from the KPS SFP, assuming air cooling, would not result in an offsite radiological release exceeding EPA PAGs.

For the loss of cooling water inventory accident in the SFP, with no air cooling or other modes of heat removal, DEK performed a site-specific analysis, for what is referred to as an adiabatic heat-up. The analysis conservatively evaluates the length of time for the uncovered spent fuel assemblies to reach a critical temperature for self-sustaining cladding oxidation (900°C) at which point the potential for significant offsite radiological release exists. Analysis shows that after approximately 17 months of decay time (or as of October 21, 2014), it will take a minimum of 10 hours, after all spent fuel cooling mediums are lost, for the hottest fuel assembly to reach the critical temperature of 900°C. As stated in NUREG-1738, 900°C is an acceptable temperature to use for assessing onset of fission product release under transient conditions if fuel and cladding oxidation occurs in air.

DEK also performed additional analyses in support of the requested EP exemptions, including:

1. Extended Loss of Normal (Design) Heat Removal Capability,
2. Rapid Drain-down Due to a Seismic Event,
3. Rapid Drain-down Due to a Cask Drop Event,

The above events are possible initiators of events that could result in a complete or near complete loss of coolant, and the potential consequences would be encompassed by the above evaluations for adiabatic and air-cooled heatup of the fuel in the SFP. The licensee provided evaluations indicating the potential of these initiating events was very small because:

- makeup water could be easily added over the extended period necessary for a loss of normal heat removal to cause a loss of coolant inventory
- the seismic hazard at the Kewaunee site is among the lowest hazards in the Continental U.S.
- the cask handling system at Kewaunee was designed and licensed as single-failure-proof

The licensee also assessed the radiological consequences due to radiation shine from a drained spent fuel pool and from a radioactive waste handling accident. These assessments demonstrated that the dose rate at the exclusion area boundary would be sufficiently low to allow ample time to implement offsite actions without planning to prevent exceeding the EPA PAGs.

To ensure adequate protection of the public health and safety, DEK will maintain a defense-in-depth philosophy at KPS that applies successive compensatory measures to prevent accidents or mitigate damage if a malfunction, accident, or naturally caused event occurs at the facility. As provided in DEK's supplemental letter dated January 10, 2014 (Reference 5), DEK furnished information concerning its makeup strategies in the event of a loss of SFP coolant inventory.

The multiple strategies for providing makeup to the SFP include: using existing plant systems for inventory makeup; supplying water through hoses to a spool piece connection to the existing SFP piping; or using a diesel-driven portable pump to take suction from Lake Michigan and provide makeup or spray to the SFP. These strategies will be maintained by a license condition. DEK further states that the equipment needed to perform these actions are located onsite, and that the external makeup strategy (using a diesel driven portable pump) is capable of being deployed within 2 hours. DEK stated that, considering the very low-probability of beyond-DBAs affecting the SFP, these diverse strategies provide defense-in-depth and time to provide makeup or spray to the SFP before the onset of zirconium cladding ignition.

In addition, in the unlikely situation that a radiological release is postulated, elements of the requested, as-exempted, EP requirements would still facilitate notification of and coordination with offsite authorities. Specifically, the licensee will continue to use the Nuclear Accident Reporting System (NARS) as a communication means to notify the State and County agencies of a declared emergency. The NARS notification form contains information that identifies the station, emergency classification, meteorological data and emergency action level. The NRC staff also notes that the as-exempted EP requirements will necessitate that the licensee be able to determine if a radiological release is occurring. If a release should occur, the licensee staff would be in a position to promptly communicate that information to offsite authorities for their consideration in determining an appropriate response.

The NRC staff provided an evaluation of DEK's exemption requests to the Commission in SECY-14-0066, "Request by Dominion Energy Kewaunee, Inc. for Exemptions from Certain Emergency Planning Requirements," dated June 27, 2014 (Reference 9), which was approved by the Commission in the staff requirements memorandum (SRM) to SECY-14-0066, dated August 7, 2014 (Reference 10).

2.0 REGULATORY EVALUATION

The regulations in 10 CFR 50.12(a)(2)(ii) provide that the NRC may, on application by a licensee or on its own initiative, grant exemptions from the requirements of the regulations in circumstances in which application of the regulation would not serve the underlying purpose of the rule or is not necessary to achieve the underlying purpose of the rule³.

The underlying purpose of the planning standards in 10 CFR 50.47(b), the requirements in 10 CFR 50.47(c)(2), and certain requirements of 10 CFR 50, Appendix E, Section IV, is to ensure that there is reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency: to establish plume exposure and ingestion pathway emergency planning zones (EPZs) for nuclear power plants; and to ensure that licensees maintain effective offsite and onsite radiological emergency response plans.

The NRC staff relied on past precedent to assess if the KPS request for EP exemptions satisfied the underlying purpose of the EP rules [the last exemptions that eliminated requirements for offsite radiological EP at a decommissioning nuclear power plant were approved in 1999 for the Zion Nuclear Power Station (Reference 11)]. The staff recognizes that the planning standards in 10 CFR 50.47(b), the requirements in 10 CFR 50.47(c)(2), and certain requirements in 10 CFR 50, Appendix E, Section IV, were developed taking into consideration the risks associated with

³ Notwithstanding the special circumstances of the exemption request, 10 CFR 50.12(a)(1) requires that the exemption must be authorized by law, not present an undue risk to the public health and safety, and be consistent with the common defense and security.

accidents that have the potential for significant offsite radiological dose consequences during operation of a nuclear power reactor at its licensed full-power level. As provided in Section 1.1 of this safety evaluation, the NRC staff has concluded that after a reactor is permanently shutdown and defueled, the risks associated with accidents that have a potential for offsite radiological release, is significantly reduced for those licensees that are reasonably aligned with the analyses presented in NUREG-1738 (Reference 8). This position has been further informed by recent SFP Studies provide in NUREG-2161 (Reference 7).

Based on the low risk of postulated beyond-DBAs that will result in significant offsite radiological consequences, the staff considers that the special circumstances condition of 10 CFR 50.12(a)(2)(ii) can be met by demonstrating that KPS satisfies the two criteria provided below. Specifically, the requested exemptions to the planning standards in 10 CFR 50.47(b), the requirements in 10 CFR 50.47(c)(2), and certain requirements in 10 CFR 50, Appendix E, Section IV, eliminating prescribed offsite EP and reducing the scope of the onsite EP activities, are considered by the staff to satisfy underlying purpose of the EP regulations if KPS site-specific analyses demonstrate:

1. An offsite radiological release will not exceed the EPA PAGs at the EAB for a DBA; and
2. In the unlikely event of a beyond-DBA resulting in a loss of all modes of cooling for the spent fuel stored in the SFP, there is a minimum of 10 hours for the hottest fuel assembly to reach the 900°C, the critical temperature threshold for self-sustained oxidation of cladding in air. This will ensure that sufficient time exists to initiate appropriate mitigating actions and, if needed, sufficient time is available for offsite agencies to take protective actions using a CEMP approach to protect the health and safety of the public.

As part of the review for DEK's exemption request, the NRC staff also considered the EP regulations in 10 CFR 72.32 and Spent Fuel Project Office Interim Staff Guidance (ISG) – 16, "Emergency Planning," (Reference 12), to ensure the requested EP exemptions are consistent with applicable requirements for ISFSIs.

2.1 Design-Basis Accidents

Pursuant to the change process permitted by 10 CFR 50.59, DEK has revised the KPS Updated Safety Analysis Report (USAR) to reflect the permanently shutdown and defueled condition of the facility. Chapter 14 of the USAR describes the DBAs and transient scenarios that could apply to KPS. The KPS USAR no longer contains any transients that continue to apply to KPS. The only accident scenarios still evaluated in the USAR, based on the permanently shutdown and defueled status of the facility, are a FHA, an accidental release of waste liquid, or an accidental release of waste gas. Since the waste gas decay tanks, volume control tanks, liquid holdup tanks, reactor coolant drain tank, and associated systems have been purged of their contents, a rupture of these components would no longer be an applicable initiator or source of such an accident. The only accident in the KPS USAR with potential for significant offsite radiological consequences is a FHA in the auxiliary building where the SFP is located. The FHA analysis for KPS shows that, following 90 days of decay time after reactor shut down, the dose consequences from an FHA are acceptable.

The NRC staff evaluated the radiological consequences of the postulated FHA DBA against the dose criteria specified in 10 CFR 50.67, "Accident source term," and using the guidance described in NRC Regulatory Guide (RG) 1.183, "Alternative Radiological Source Terms for

Evaluating Design Basis Accidents at Nuclear Power Reactors,” issued July 2000 (Reference 13). RG 1.183 provides guidance to licensees on acceptable application of alternative source term (AST) submittals, including acceptable radiological analysis assumptions for use in conjunction with the accepted AST.

The FHA-specific dose acceptance criteria are specified in NUREG-0800, “Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR [*Light-Water Reactor*] Edition,” Section 15.0.1, “Radiological Consequence Analyses Using Alternative Source Terms,” issued July 2000 (Reference 14). The dose acceptance criterion for the FHA is a Total Effective Dose Equivalent (TEDE) of 6.3 roentgen equivalent man (rem) at the EAB for any 2 hours.

For this evaluation, the licensee should meet the criteria in the EPA’s “Protective Action Guide and Planning Guidance for Radiological Incidents,” Draft for Interim Use and Public Comment, issued March 2013 (PAG Manual) (Reference 15). The EPA developed this manual to assist public officials in planning for emergency response to radiological incidents.

2.2 Beyond Design-Basis Accidents

The NRC staff has long recognized that the frequency of a large radiological release at a decommissioning power reactor storing irradiated fuel in a SFP is lower than the frequency of a large offsite radiological release at an operating reactor. As stated previously in this safety evaluation, the NRC staff completed a detailed study of decommissioning SFP risk, which is documented in NUREG-1738 (Reference 8). For spent fuel that has aged one year, the NRC staff estimated the frequency of fuel uncover to range from 5.8 per 10 million years to 2.4 per million years for the plants studied. The frequency of fuel uncover was used as a simplifying and conservative surrogate for the overall frequency of severe fuel damage resulting from inadequate cooling following a loss of coolant inventory. Beyond design-basis seismic initiating events dominate the fuel uncover frequency estimates. Fuel cask handling accidents were also significant contributors to the frequency estimate. Because the configuration of the fuel, the storage racks, and the pool structure could be affected in unpredictable ways by a major seismic event or cask drop, the associated consequence evaluation could not rule out conditions where air cooling would be inadequate, even after many years of decay. Assuming that a worst-case spent fuel uncover accident was to occur at KPS, the licensee assessed the time that would be available for response measures before the onset of a potential radiological release. The licensee’s analyses considered both situations where the heat of oxidation affected the heat-up rate in air-cooled configurations and the adiabatic heat-up in configurations where air cooling would be precluded. In this safety evaluation, the staff verified licensee’s assumptions, calculations, and overall analyses of these two beyond-DBAs in support of DEK’s justification for the EP exemption requests in accordance with the criteria discussed in Section 2.0 of this safety evaluation.

3.0 TECHNICAL EVALUATION

3.1 Design-Basis Accidents

DEK states that the KPS USAR has been revised to reflect the permanently shutdown and defueled status of the facility. The only DBAs that remain in the USAR for the permanently shutdown and defueled KPS reactor are the FHA, an accidental release of waste liquid, or an accidental release of waste gas.

3.1.1 Fuel Handling Accident

In the AST evaluation used during KPS power operation, the radiological consequence analysis evaluated a postulated FHA in the containment with no credit taken for containment isolation. Since the assumptions and parameters used for an FHA inside containment are identical to those for an FHA in the auxiliary building, the resulting radiological consequences are the same regardless of the location of the accident. Following cessation of operations, an FHA onto the top of the reactor core (or elsewhere within containment) is no longer possible and therefore no longer part of the licensing basis. However, an FHA in the SFP (which is located in the auxiliary building) is still possible at KPS, as long as spent fuel is stored in the SFP.

The licensee defines the FHA in the SFP as the dropping of a spent fuel assembly onto the SFP floor or the racks that hold the spent fuel such that the cladding of all the fuel rods in one assembly ruptures. The gap activity in the damaged rods is instantaneously released into the SFP. The activity is assumed to pass through the 23 feet of required minimum water level over the top of the irradiated fuel assemblies in the SFP. It is postulated that the activity released from the SFP then mixes with the auxiliary building atmosphere before being released directly to the environment. The FHA analysis postulates that the release to the SFP atmosphere is not mitigated en-route to the environment. This assumption is consistent with the current licensing basis FHA analysis, which does not credit the SFP ventilation system for accident mitigation. The activity is assumed to be exhausted from the auxiliary building at a rate established to complete the release in 2 hours (consistent with RG 1.183). The NRC staff finds that the assumptions in the licensee's analysis is consistent with the current licensing basis FHA analysis, which does not credit the auxiliary building ventilation system for accident mitigation but assumes that it continues to operate to conservatively expel the activity to the environment.

The licensee assumed an overall decontamination factor of 200 for iodine in elemental and particulate forms in the SFP water with minimum water depth of 23 feet, which is consistent with the guidelines provided in RG 1.183. Also, a fission product decay period of 90 days (after cessation of operations) is assumed. The NRC staff finds the 90-day decay period assumption in the licensee's analysis to be conservative because KPS has been defueled since May 14, 2013 (greater than 90 days).

For calculation of doses at the EAB, the licensee used current licensing basis atmospheric dispersion factors.

The licensee evaluated the radiological consequences resulting from the postulated FHA for the permanently defueled condition at KPS and concluded that the radiological consequences at the EAB is within the dose criteria specified in 10 CFR 50.67 and accident specific dose criteria described in NUREG-0800, Section 15.0.1. The staff has reviewed the licensee's evaluation relying upon information provided by the licensee and NRC staff experience in performing similar reviews. The staff reviewed the methods, parameters, and assumptions that the licensee used in its radiological dose consequence analyses and finds that they are consistent with the conservative guidance provided in RG 1.183. The revised analysis also shows that 90 days after shut down, the dose consequences at the EAB to be 0.001 rem, which is less than the limits of EPA PAGs at the EAB.

3.1.2 Accidental Release of Waste Liquid

Postulated accidents that could result in the release of radioactive liquids are those that involve the rupture or leaking of system pipe lines or storage tanks. The largest vessels are the three

liquid holdup tanks, sized such that two tanks can hold more than one reactor coolant liquid volume, used to store the normal recycle or water fluids produced during reactor operation.

The licensee stated that since the KPS reactor is permanently shutdown, defueled, and placed in a long-term safe storage condition for decommissioning, the liquid waste tanks and lines have been drained. The NRC staff concludes that a failure involving radioactive liquid waste systems that could exceed the dose criteria specified in 10 CFR 50.67, or the limits of EPA PAGs at the EAB, are no longer possible since the tanks have been purged of their contents. Therefore, this hazard no longer exists.

3.1.3 Gas Decay Tank (GDT) and Volume Control Tank (VCT) Rupture Accidents

The KPS licensing basis includes analyses of the radiological consequences of a rupture of a GDT and a rupture of the volume control tank VCT. During reactor operation, the GDTs are used to store processed radioactive gases removed from the reactor coolant to allow for radioactive decay before the controlled release to the environment. The VCT is a component in the plant's chemical and volume control systems that serves as a surge volume to balance differences in letdown and makeup flow rates while maintaining reactor coolant inventory. Part of the reactor coolant (known as letdown) is removed from the RCS, cooled, filtered, demineralized, and degassed.

The licensee stated that the GDT, VCT, and associated lines and tanks have been drained and purged of their contents since the KPS reactor is permanently shutdown and defueled, and is in a long-term safe storage condition for decommissioning. The NRC staff concludes that a failure involving radioactive gas release from these tanks that could exceed the dose criteria specified in 10 CFR 50.67, or the limits of EPA PAGs at the EAB, are no longer possible since the tanks that have been purged of their contents, and therefore, this hazard no longer exists.

3.1.4 Design-Basis Accidents Conclusion

As described above, the NRC staff reviewed the assumptions, inputs, and methods used by the licensee to assess the radiological consequences of DBAs given the permanently shutdown and defueled condition at KPS. The staff finds that the licensee used analysis methods and assumptions consistent with the conservative regulatory requirements and guidance identified in Section 2.1 above. The NRC staff compared the doses estimated by the licensee to the acceptance criteria in NUREG-0800, Section 15.0.1. The staff finds that given the permanently shutdown and defueled condition of KPS, with spent fuel stored in the SFP, the radiological consequences of DBAs are well below the limits of offsite radiological release and exposure limits. The staff further finds that sufficient safety margins and adequate defense-in-depth exist at KPS to address unanticipated events and to compensate for uncertainties in accident progression and analysis assumptions and parameters. The NRC staff finds with respect to the consequences of the remaining DBAs at KPS, any offsite radiological release will not exceed the EPA PAGs at the EAB. Therefore, the underlying purposes of the regulations applicable to emergency planning would still be achieved if the requested EP exemptions were granted as discussed in Section 2.0 of this safety evaluation.

3.2 Beyond Design-Basis Accidents

In Attachment 1 to DEK letter dated January 16, 2014 (Reference 16), the licensee discussed seven beyond-DBA scenarios postulated for KPS as described in Section 1.1 of this safety evaluation. Supporting calculations were provided in Enclosure 4 to the same letter. The NRC

staff has reviewed the licensee's beyond-DBAs and finds that the scope of these postulated events bound the risk of offsite radiological release at KPS. The NRC staff focused its review on the evaluation of beyond-DBAs involving substantial loss of SFP coolant inventory because these events, although very unlikely, have the greatest potential to result in a significant offsite radiological release and challenge emergency response capabilities. The staff performed a detailed review of the supporting calculations concerning: (1) an evaluation of time to the potential onset of fuel damage with air cooling available; and (2) an evaluation of the time for the hottest fuel assembly to heat adiabatically to a temperature at which runaway oxidation of the cladding is possible. The results of the licensee's analyses show that the only beyond-DBA analyses that could result in a significant offsite radiological release based on the current spent fuel decay time is the adiabatic heat-up analyses. The staff notes that detailed assessment of the adiabatic heat-up is important because it is also a criteria used by the staff in its finding of special circumstances related to these exemptions. The staff also reviewed the complete loss of cooling water inventory with air cooling in detail because of the potential for a large offsite radiological release, the complexity of the analysis, and the significance in demonstrating that the spent fuel decay heat load is sufficiently reduced at KPS to preclude an offsite radiological release even if all the water inventory were somehow drained from the SFP.

3.2.1 Implementation of Supporting Actions and Commitments

In accordance with the safety analysis in NUREG-1738 (Reference 8), the beyond design-basis event sequences that dominate risk at a decommissioning power reactor are limited to a large earthquake and cask-drop events. This is an important difference relative to an operating power reactor, where typically a large number of different initiating events make significant contributions to risk. Specifically, the NUREG-1738 study provided the following assessment:

The staff found that the event sequences important to risk at decommissioning plants are limited to large earthquakes and cask drop events. For emergency planning (EP) assessments, this is an important difference relative to operating plants where typically a large number of different sequences make significant contributions to risk. Relaxation of offsite EP a few months after shutdown resulted in only a 'small change' in risk The change in risk due to relaxation of offsite EP is small because the overall risk is low, and because even under current EP requirements, EP was judged to have marginal impact on evacuation effectiveness in the severe earthquakes that dominate SFP risk. All other sequences including cask drops (for which emergency planning is expected to be more effective) are too low in likelihood to have a significant impact on risk. For comparison, at operating reactors, additional risk-significant accidents for which EP is expected to provide dose savings are on the order of 1×10^{-5} per year, while for decommissioning facilities, the largest contributor for which EP would provide dose savings is about two orders of magnitude lower (cask drop sequence at 2×10^{-7} per year).

Assurance that the results of the NUREG-1738 analysis bound the plant-specific conditions at KPS can be determined by assessing the facility against certain design and operational characteristics that were assumed in the risk analysis. These characteristics were identified in the NUREG-1738 study as recovery, mitigation, and emergency response activities assumptions that were relied on to evaluate the likelihood of success in event sequences. These characteristics are referred to as Industry Decommissioning Commitments (IDCs) and Staff Decommissioning Assumptions (SDAs) in the NUREG-1738 analyses.

In Attachment 1 to DEK letter dated December 11, 2013 (Reference 4), the licensee described the conformance of the KPS facility and operations with the IDCs and the SDAs decommissioning commitments and actions. The licensee's discussion of the IDCs and SDAs also addressed measures in place to minimize the potential risk from event sequences that dominate risk at a decommissioning reactor with fuel stored in a SFP (e.g., those IDCs and SDA related to fuel cask handling activities and seismic events).

The following NRC staff evaluation focuses on the of the KPS conformance with IDCs and SDAs that dominate the risks identified in NUREG-1738 and are related to the design and operation of structures, systems, and components associated with SFP:

IDC #1 states: Cask drop analyses will be performed or single failure-proof cranes will be in use for handling of heavy loads (i.e., phase II of NUREG-0612 will be implemented).

Assessment of KPS conformance with commitment: To provide for safe handling of heavy loads in the vicinity of the SFP, DEK upgraded the KPS auxiliary building crane to a single-failure-proof design. The NRC accepted the upgraded crane as single-failure-proof for loads up to 50 tons in the safety evaluation associated with KPS License Amendment 200, which was issued November 20, 2008 (Reference 17). In KPS License Amendment 205, which was issued April 30, 2009 (Reference 18), the NRC accepted a revised seismic analysis methodology for the crane to support qualification of the crane for the full rated load of 125 tons. The licensee qualified the crane for the rated load using the revised seismic analysis methodology, which was necessary to support use of the crane with the selected dry fuel storage system. Additionally, DEK stated that the handling of heavy loads within the protected area is controlled by administrative procedures designed to satisfy the guidelines of NUREG-0612, "Control of Heavy Loads at Nuclear Power Plants: Resolution of Generic Technical Activity A-36," issued July 1980 (Reference 19).

The NRC staff finds that qualification and operation of the KPS auxiliary building crane as single-failure-proof handling system satisfies the conditions assumed in the analysis presented in NUREG-1738 with respect to protection from potential cask drop events.

IDC #5 states: Spent fuel pool instrumentation will include readouts and alarms in the control room (or where personnel are stationed) for spent fuel pool temperature, water level, and area radiation levels.

SDA #3 states: Control room instrumentation that monitors SFP temperature and water level will directly measure the parameters involved. Level instrumentation will provide alarms at levels associated with calling in offsite resources and with declaring an emergency.

Assessment of KPS conformance with these commitments and assumptions: The KPS SFP has been provided with instrumentation and alarms in the control room to notify personnel of abnormal pool water level, temperature, and area radiation levels. The readouts for temperature and level are available locally, and the area radiation level readout is located in the control room. In addition, DEK committed to install supplemental seismically qualified SFP level instrumentation (DEK letter dated August 23, 2013, "Request to Rescind Order Modifying

Licenses with Regard to Requirements for Reliable Spent Fuel Pool Instrumentation," Reference 20). This additional instrumentation will provide two channels of pool level with readouts located in the SFP heat exchanger room and low level alarms in the control room. The SFP levels and alarms are used to assess initiating conditions for declaring an emergency at KPS.

The NRC staff finds that the SFP level of monitoring capability is consistent with the commitments and assumptions in the analysis presented in NUREG-1738.

IDC #6 states: Spent fuel pool seals that could cause leakage leading to fuel uncover in the event of seal failure shall be self-limiting to leakage or otherwise engineered so that drainage cannot occur.

Assessment of KPS conformance with commitment: To prevent inadvertent draining of the SFP by the SFP gate seals, the KPS SFP gates are designed such that any leakage would be limited to an elevation that maintains stored fuel covered with water. Any leakage by the gate seals would be limited by the location of the bottom of the gate opening, which is above the top of the stored fuel.

The NRC staff finds that this configuration is consistent with the assumptions used in the analysis presented in NUREG-1738.

IDC #7 states: Procedures or administrative controls to reduce the likelihood of rapid drain down events will include: (1) prohibitions on the use of pumps that lack adequate siphon protection or (2) controls for pump suction and discharge points. The functionality of anti-siphon devices will be periodically verified.

SDA #4 states: Licensee determines that there are no drain paths in the SFP that could lower the pool level (by draining, suction, or pumping) more than 15 feet below the normal pool operating level.

Assessment of KPS conformance with these commitments and assumptions: The KPS SFP is protected against loss of water by the design of attached systems and by procedures governing the transfer of water in or out of the SFP. The cooling system connections to the SFP are designed to preclude a substantial loss of water by locating the piping penetrations and the termination of any internal piping well above the stored fuel. In addition, the cooling system return lines are equipped with check valves just outside the pool wall penetration to prevent reverse flow through these lines. The KPS SFP design precludes a rapid reduction in SFP coolant inventory, and formal procedures control activities associated with reducing water inventory in the spent fuel storage area.

The NRC staff finds that the design and operation of systems connected to the KPS SFP is consistent with these commitments and assumptions considered in the analysis presented in NUREG-1738.

IDC #8 states: An onsite restoration plan will be in place to provide repair of the spent fuel pool cooling systems or to provide access for makeup water to the spent fuel pool. The plan will provide for remote alignment of the makeup source to the spent fuel pool without requiring entry to the refuel floor.

Assessment of KPS conformance with commitment: The KPS seismic Class I service water system provides the safety-related make-up water capability for the SFP. The service water system has redundant pumping capability and redundant power supplies, both offsite and onsite, adequate to support this function. The station also includes two motor-driven fire pumps, each capable of being powered from offsite sources or either of two emergency diesel generators. Finally, for defense-in-depth, KPS maintains a diesel-powered emergency make-up pump capable of supplying water from Lake Michigan to the SFP. By procedure, these systems are routinely tested to ensure their availability. Additionally, there are procedures in place that provide for the use of a backup means (beyond the capabilities required by the KPS design basis for SFP makeup) of SFP water makeup which can be executed without requiring entry to the refuel floor.

The NRC staff finds that the make-up water availability conforms to the make-up water capability assumed for the NRC staff analysis presented in NUREG-1738.

SDA #1 states: Licensee's SFP cooling design will be at least as capable as that assumed in the risk assessment, including instrumentation. Licensees will have at least one motor-driven and one diesel-driven fire pump capable of delivering inventory to the SFP:

Assessment of KPS conformance with assumption: The normal SFP cooling system consists of two circulating pumps, one heat exchanger, two filters, a demineralizer, and associated piping, valves, and instrumentation. If one of the two pumps should fail, the remaining pump can remove the heat load associated with typical refueling one-third core discharges. The current decay heat production with a full core discharged more than one year ago is less than the heat load associated with a typical refueling discharge. As discussed in IDC #8 above, the licensee has two motor-driven fire pumps, with backup diesel power supply, that can delivery inventory to the SFP.

The NRC finds that the heat removal capability of the KPS SFP cooling system is consistent with the assumptions considered in the analysis presented in NUREG-1738.

SDA #6 states: Each decommissioning plant will successfully complete the seismic checklist provided in Appendix 2B to NUREG-1738. If the checklist cannot be successfully completed, the decommissioning plant will perform a plant specific seismic risk assessment of the SFP and demonstrate that SFP seismically induced structural failure and rapid loss of inventory is less than the generic bounding estimates provided in NUREG-1738 ($<1 \times 10^{-5}$ per year including non-seismic events).

Assessment of KPS conformance with assumption: As noted in NUREG-1738, severe seismic events with relatively low frequencies of occurrence have been found to be the dominant challenge to spent fuel pool structural integrity. Attachment 1 to Appendix 2B of NUREG-1738 presents a seismic checklist to establish a high-confidence of a low probability of spent fuel pool structural failure as a result of seismic events below 1.2g peak ground acceleration. Item 10 of the NUREG-1738 seismic checklist provides an alternative to the detailed seismic analysis involving a delay in any reduction in EP capability until plant-specific analyses suggest a zirconium cladding fire is no longer a credible concern. The licensee has provided site-specific analyses indicating that, by the end of October 2014, a zirconium fire would no longer be a credible outcome of events that lead to a complete draining of the KPS SFP and allow development of natural circulation air cooling. The NRC staff's evaluation of that site-specific

analysis is provided in Section 3.2.2 of this safety evaluation. Additionally, DEK provided an analysis of adiabatic heating of the fuel indicating that, by the end of October 2014, the heat generated within the fuel could not heat the fuel cladding to temperatures that would support a zirconium fire in less than 10 hours. The staff finds that 10 hours would allow sufficient time to initiate appropriate mitigating actions consistent with plant conditions and, if needed, there is sufficient time for offsite agencies to take protective actions using a CEMP to protect the health and safety of the public. Furthermore, the seismic hazard estimates prepared by the U.S. Geologic Survey indicate that the KPS site is in a seismically stable region with low potential for damage to robust structures like the KPS SFP.

The NRC staff finds that by the end of October 2014, the potential for seismically-initiated radiological releases from the SFP would be acceptably small to conform with the NRC staff's analysis present in NUREG-1738 because the fuel would either be adequately cooled by air or heat so slowly that adequate time for implementation of prevention and mitigation measures would be available.

SDA #7 states: Licensees will maintain a program to provide surveillance and monitoring of Boraflex [*a neutron absorber material*] in high-density spent fuel racks until such time as spent fuel is no longer stored in these high-density racks.

Assessment of KPS conformance with assumption: The KPS SFP does not contain Boraflex panels. However, the KPS has credited other neutron absorber materials in the SFP racks for nuclear criticality safety analysis to help maintain subcriticality. In order to ensure that the neutron absorbers will remain within the assumptions used in the nuclear criticality safety (NCS) analysis of record (AOR), the KPS USAR documents surveillance program commitments. These surveillance programs are used to monitor the spent fuel storage rack neutron absorber material for degradation and confirm that the materials will perform as designed for in the NCS AOR.

The NRC finds that the neutron monitoring surveillance programs satisfies the assumption regarding the integrity of solid neutron absorbing panels assumed in the analysis presented in NUREG-1738.

Based on the above evaluations, the NRC staff concludes that the design and operation of structures, systems, and components associated with SFP storage provide for safe storage of spent fuel and are consistent with the capabilities assumed in the analysis presented in NUREG-1738.

The remaining IDCs and SDAs in NUREG-1738 (that were not specifically discussed in the above evaluation) are related to administrative controls and procedures. In Attachment 1 to DEK letter dated December 11, 2013 (Reference 4), the licensee describes in detail the controls and procedures that address these remaining IDCs and SDAs. The staff has reviewed the licensee's responses and finds the programs and procedures stated to exist at KPS reasonably address the remaining IDCs and SDA and are consistent with the intent of the analysis presented in NUREG-1738.

The NRC staff concludes that the risk analysis presented in NUREG-1738 is applicable to spent fuel storage in the SFP at KPS.

3.2.2 Site Specific Analyses

The licensee provided a qualitative assessment of both DBAs and beyond-DBAs for the defueled plant state that could involve offsite radiological consequences in Attachment 1 to DEK's request for exemptions from EP requirements at KPS dated July 31, 2013 (Reference 3). For beyond-DBAs evaluated for EP purposes, the licensee compared fuel and SFP design parameters for KPS with those assumed in NRC-sponsored analyses of beyond-DBAs affecting spent fuel storage. Subsequently, the licensee performed site-specific quantitative analyses of beyond-DBAs in DEK letter dated January 16, 2014 (Reference 16).

A. Analysis of Onset of Fuel Damage

The licensee compared the fuel and rack design characteristics of the KPS spent fuel applicable to an event involving a complete loss of SFP coolant inventory with the characteristics used in the analysis for the reference PWR presented in NUREG/CR-6451 (Reference 6), and with NUREG/CR-4982, "Severe Accidents in Spent Fuel Pools in Support of Generic Safety Issue 82," issued July 1987 (Reference 21). Of these two reports, the analysis presented in NUREG/CR-6451 used a model of the fuel cladding heat-up and fuel parameters more representative of the KPS spent fuel. The analysis presented in NUREG/CR-6451 projected that the fuel cladding temperature for representative PWR fuel in high-density storage racks would be adequately cooled by air flow in a fully drained pool after 17 months of decay time of spent fuel stored in the representative PWR spent fuel pool. The criterion selected for adequate cooling was a cladding temperature of no more than 565°C (1049 degrees Fahrenheit (°F)). This temperature has been associated with incipient cladding damage, but maintains substantial margin to temperatures likely to lead to runaway cladding oxidation. Based on this qualitative comparison, DEK concluded that the fuel from the final full core discharge would remain below 565°C (1049°F) in an air-cooled configuration after 17 months decay.

Additionally, DEK provided a confirmatory quantitative analysis of air-cooling of spent fuel at KPS in Enclosure 4 of the letter dated January 16, 2014 (Reference 16). This analysis used a GOTHIC (Generation of Thermal-Hydraulic Information for Containments) model of the auxiliary building fuel handling area to determine quasi steady-state air temperatures in specific locations within the building, including the down-comer region around the spent fuel. The licensee described the GOTHIC code as a general purpose thermal-hydraulics software package for the analysis of nuclear power plant containments, confinement buildings, and system components. Using these air temperatures, a separate model using the COBRA code determined the maximum fuel cladding temperature assuming a completely drained SFP and the resulting natural circulation air flow through the fuel assemblies. The licensee stated that COBRA was developed by Pacific Northwest Laboratories in the 1990s to model the heat transfer within and between fuel assemblies in storage and transportation systems. The licensee's contractor, Sargent and Lundy, Inc., verified and validated both codes as part of their quality assurance program.

The GOTHIC air temperature analysis included a number of assumptions regarding heat sources and sinks. The ventilation system was assumed to be in service in an off-normal alignment that resulted in an air exchange rate of 2.3 Fuel Handling Area volumes per hour. The analysis also included consideration of heat absorption by structures other than floors; heat transfer through the structures to the environment; heat generation by electrical equipment; and the heat gain from solar radiation. With these assumptions, the maximum temperature in the space between the fuel storage racks and the pool walls was found to be below 82°C (180°F) for the October 2014 case and below 91°C (195°F) for the May 2015 case. These temperatures

were then used to establish the fuel channel entry air temperatures assuming the downward air flow absorbed half the heat generated by the peripheral fuel assemblies.

The determination of the highest cladding temperature using the COBRA code considered the actual fuel distribution in the pool to select a limiting configuration of assemblies for analysis purposes. This configuration consisted of one assembly from the final discharge that defueled the reactor following the last operating cycle (Cycle 32) with fuel assemblies from Cycle 32 in two adjacent storage locations and fuel assemblies from Cycle 29 in the two remaining adjacent storage locations, which constituted a group of five total assemblies. For use in the model, this was reduced to a row of three assemblies with heat transfer modeled between the Cycle 32 assembly and the two Cycle 29 assemblies; the interface between the center Cycle 32 assembly and the adjacent Cycle 32 assemblies was modeled with no heat transfer based on an expectation of nearly equal temperatures. This configuration was considered conservative because the actual fuel distribution following the reactor defueling consisted of one Cycle 32 assembly in the center surrounded by an assembly from an earlier cycle on each of the four faces. These surrounding assemblies are adjacent to only one Cycle 32 assembly, resulting in a distribution of one Cycle 32 assembly to no less than four assemblies from earlier operating cycles. The licensee determined that the actual fuel distribution had no more than one Cycle 31 assembly and one Cycle 30 adjacent to a Cycle 32 assembly; the remaining two adjacent storage locations contained fuel from Cycle 29 or earlier, and, therefore, generated less decay heat than the fuel used in the more recent operating cycles. Thus, the fuel configuration assumed for determination of peak cladding temperature is conservative compared to the actual fuel distribution.

Among the Cycle 32 assemblies, the model included a factor representing the ratio of peak to average decay heat generation to model the hottest Cycle 32 assembly. However, the ratio used in the model represented the actual highest decay heat assembly (assembly power ratio of 1.386) among those in the groups of five assemblies with the highest total decay heat, which is lower than the absolute peak decay heat ratio for Cycle 32 assemblies (assembly power ratio of 1.449). Since the analysis was based on groups of five assemblies, this assumption was reasonably conservative.

To determine the air flow through each assembly, the analyst compared the thermal driving head developed by the heat transfer to the air, which was determined by the COBRA code, against the head loss resulting from frictional losses as the air flows through the rack opening and fuel assembly, which was calculated using standard methods. Air flow rate affects both the flow resistance and the thermal driving head developed by the temperature difference between the inlet and outlet of the fuel assemblies, so the air flow rate was determined by iteration for the high decay heat (Cycle 32) and low decay heat (Cycle 29) assemblies for both the fall and summer conditions. Since the downward flow of air around the racks was assumed to absorb half the heat released from the peripheral fuel assemblies, the inlet air temperature was also determined using iteration. The computed inlet air temperatures were 93°C (200°F) for the October 2014 case and 103°C (217°F) for the May 2015 case.

The results of this evaluation showed that the peak cladding temperature would not exceed the temperature selected to represent the onset of potential cladding damage, 565°C (1049°F). The COBRA results show that the air outlet temperature for the October 2014 case would be 534°C (994°F) for the central Cycle 32 assembly and 256°C (493°F) for the adjacent older assemblies. For the May 2015 case, the COBRA results show that the outlet temperature is 456°C (852°F) for the central Cycle 32 assembly and 267°C (512°F) for the adjacent assemblies. These temperatures are below the temperature associated with the onset of

potential cladding damage, and far below temperatures of 900°C (1652°F) associated with rapid cladding oxidation and the potential for a significant radiological release. Also, the results suggested that the hotter assemblies were more affected by the decay heat rate than the inlet air temperature, while the results suggested the converse for the cooler assemblies.

Based on the provided analysis and the results of previous studies, the NRC staff concludes that there is reasonable assurance that, by the end of October 2014, the KPS spent fuel would remain at temperatures far below those associated with a significant radiological release under conditions where air cooling of the stored fuel is available. Although some assumptions, such as the availability of an off-normal ventilation flow pattern, were not conservative, the available margin to a substantial release was sufficiently large to overcome all potential concerns with the assumed conditions.

B. Heat-Up Analysis Assuming No Air Cooling

The licensee also presented its evaluation of the response of the hottest fuel assemblies under conditions where the heat generated within the assembly would be retained within the assembly. The calculation used an assumed initial temperature, the calculated thermal capacity of the fuel assembly within the heated length of the assembly, and an estimated decay heat rate for the hottest fuel assembly. From this information, the time to reach temperatures of 565°C (1049°F), which corresponds to incipient fuel cladding damage, and 900°C (1652°F), which corresponds to runaway cladding oxidation and the potential for a large radiological release, were calculated.

An initial fuel assembly temperature of 90°F (32°C) was assumed because it is representative of the current pool temperature and pool temperature is expected to continue decreasing as the decay heat production decreases. The time for the fuel assembly to reach specified temperatures was calculated assuming the fuel assembly was dry at the initial temperature, which is conservative relative to the actual conditions following a rare and challenging event that could lead to a loss of spent fuel pool water. For these events, water would be expected to be present for a significant time, considering the large volume of water initially in the pool, and absorb nearly all the decay heat generated during that time.

The thermal capacity of the fuel assembly was calculated based on the dimensions and materials used for the most recent fuel assembly design, which are also the assemblies producing the highest decay heat. The thermal capacity of the fuel assemblies considered only the zirconium alloy tubes and uranium dioxide fuel within the approximately 12 foot heated length of the 179 fuel rods, the 16 guide tubes, and the single instrument tube within a fuel assembly. The guide tubes and instrument tubes were included in the thermal capacity of the fuel assembly as 17 empty zirconium alloy tubes. Although the fuel assembly was constructed from a zirconium alloy, the licensee concluded that the specific heat and density of pure zirconium could be used since there is little variation in these properties among other pure metals and their alloys.

The total decay heat rate for the Cycle 32 core was estimated using a computer program called HEATUP, which provided conservative estimates of total decay heat load from the Cycle 32 core relative to that calculated by the ORIGEN code. The heat generation by the hottest assembly was estimated by multiplying the average assembly heat generation by a factor of 1.449. Since the heat from the hottest assembly was absorbed over the entire heated length of the assembly, the heat generation was treated as uniform along the length of the assembly.

The results of the calculation indicated that the time to reach 900°C (1652°F) would exceed 10 hours after approximately 17 months of decay (October 21, 2014).

The NRC staff found the adiabatic heat-up calculation adequate to demonstrate that a time exceeding 10 hours would be available before a significant radiological release might occur following an accident leading to loss of SFP water with no air cooling. The adiabatic heat-up calculation is a simplified method for determining the minimum time available for deployment of mitigation equipment and, if necessary, implementation of protective actions by offsite authorities using a CEMP approach. The methodology used was suitably conservative to compensate for simplifications related to phenomena such as axial variation in heat generation and the potential acceleration of the temperature increase as exothermic zirconium oxidation begins at high temperatures. The conservatism includes discounting the time for the water to drain from the SFP and neglect of additional heat sinks and heat transfer mechanisms that would exist in scenarios involving loss of SFP water inventory, even in situations where cooling air flow would be blocked.

C. Assessment of Specific Events at KPS

The staff also reviewed additional low probability event assessments provided by DEK and described below:

1. Extended Loss of Normal (Design) Heat Removal Capability

By October 2014, approximately 26 days will be available to restore water cooling to the SFP before the SFP water level reaches three feet above the top of the fuel (additional time would be available before fuel is uncovered). Because of the relative ease with which alternative means of supplying cooling water to the SFP can be established, it is not reasonable to postulate that fuel damage can occur due to a loss of normal cooling capability to the SFP.

2. Rapid Drain-down Due to Seismic Events

Given the robust structural design of SFPs, it is expected that a seismic event with peak spectral acceleration several times larger than the safe shutdown earthquake (SSE) would be required to produce catastrophic failure of the structure. Based on the low probability of a seismic event of sufficient magnitude to cause failure of the SFP in the geographic region where KPS is located, a catastrophic beyond design-basis seismic event as an initiator of a rapid SFP drain-down event is not considered credible at KPS.

3. Rapid Drain-down Due to Cask Drop Event

KPS has a single-failure proof auxiliary building crane that is used for lifting heavy loads, such as spent fuel casks, over the SFP. The seismic analysis methodology for the auxiliary building crane is required by KPS License Condition 2.C.(11) and is being maintained in the KPS license. Because the auxiliary building crane will not lower its load in an uncontrolled fashion during a seismic event, a cask drop event is not considered a credible initiator of a rapid SFP drain-down event at KPS.

4. Shine from an Empty Spent Fuel Pool

Although a significant release of radioactive material from the spent fuel is not possible in the absence of water cooling after approximately 17 months, the potential exists for radiation

exposure to an offsite individual in the event that shielding of the fuel is lost (a beyond-design-basis event). The gamma radiation dose rate at the site boundary would be sufficiently low, such that it would take more than a month for the event to exceed the EPA early-phase Protective Action Guidelines (PAG) of 1 Rem. The EPA early-phase PAG is defined as the period beginning at the projected or actual initiation of a release and extending a few days later. The PAGs were developed to respond to a mobile airborne plume that could transport and deposit radioactive material over a large area. In contrast, the radiation field formed by scatter from a drained SFP would be stationary rather than moving and would not cause transport or deposition of radioactive materials. This would allow sufficient time to develop and implement on-site mitigative actions and provide confidence that additional offsite measures could be taken using a CEMP approach if efforts to re-establish shielding over the spent fuel are delayed.

5. Radioactive Waste Handling Accident

This accident evaluates the drop of a high integrity container (HIC) in the auxiliary building such that its entire contents of radioactive dewatered demineralizer resin (i.e., 100%) escapes. This analysis did not postulate any specific mechanism for release; however, ten percent of the HIC contents are dispersed into the air in aerosol form. A small fraction (i.e., 10%) of the escaped resin is non-mechanistically assumed to be released as airborne radioactivity and pass from the auxiliary building directly to the environment. The sum of the whole body and inhalation doses at the EAB is 0.015 rem, which is much less than the 1 rem limit of the EPA PAG.

The NRC staff finds the DEK analyses methods and conclusion of these additional beyond design-basis postulated accident to be reasonable. These additional beyond-DBA analyses acceptably demonstrate that the adiabatic heat-up and the loss of all SFP coolant inventory (with air cooling) bound the accidents that have a potential for significant offsite radiological release. The staff did not specifically rely on these additional analyses to support its regulatory evaluation of these exemptions (as discussed in Section 2.0 of this safety evaluation).

3.2.3 Conclusion Concerning Beyond Design-Basis Loss of SFP Cooling Water Inventory Accidents (with and without Air Cooling)

The NRC staff has confirmed licensee's analysis showing that by October 21, 2014, there will be a minimum of 10 hours from the initiation of the accident until the cladding reaches a temperature where significant offsite radiological release might occur. This scenario would require a very unlikely beyond-DBA where the SFP coolant inventory is lost in such a manner that all methods of heat removal from the spent fuel are no longer available. Under conditions where cooling air flow can develop, suitably conservative calculations indicate that, by October 30, 2014, the fuel would remain at temperatures where the cladding would be undamaged for an unlimited period. This confirms that there is sufficient time available to support deployment of mitigation equipment consistent with plant conditions and if needed, for offsite agencies to take protective actions using a CEMP approach to protect the health and safety of the public. This conclusion supports the regulatory criteria being used by the staff for determining whether the underlying purpose of the EP regulations will continue to be met considering offsite radiological emergency plans will no longer be required and the scope of onsite EP activities will be reduced as discussed in Section 2.0 of this safety evaluation.

4.0 EXEMPTIONS

Pursuant to 10 CFR 50.12, the Commission may, upon application by any interested person or upon its own initiative, grant exemptions from the requirements of 10 CFR Part 50 when: (1) the

exemptions are authorized by law, will not present an undue risk to public health or safety, and are consistent with the common defense and security; and (2) when special circumstances are present. The NRC staff reviewed this request to determine whether the specific exemptions should be granted.

This section reflects the NRC staff's evaluation of the DEK exemptions as provided to the Commission in SECY-14-0066 on June 27, 2014 (Reference 9). The Commission approved the exemptions on August 7, 2014, in the SRM to SECY-14-0066 (Reference 10).

4.1 Specific Exemptions for 10 CFR 50.47

DEK's letter dated July 31, 2013 (Reference 3), as supplemented by letters dated December 11, 2013 (Reference 4), and January 10, 2014 (Reference 5), requested exemptions from certain Sections of 10 CFR 50.47 (as indicated in the following evaluation by ~~strikeout~~ and **bolded** text). Based upon the NRC staff's review, there are several differences in the exemption language that DEK requested and the exemption language that is being granted by this exemption. These differences are based on maintaining consistency with previous precedent and incorporating additional editorial clarifications identified during the review process for SECY-14-0066.

(4.1.1) 10 CFR 50.47(b)

The onsite ~~and, except as provided in paragraph (d) of this section, offsite~~ emergency response plans for nuclear power reactors must meet the following standards:

DEK has provided site-specific analyses that show that, 90 days after shut down, the offsite radiological consequences of DBAs at KPS will not exceed the limits of the EPA PAGs at the EAB. Additionally, DEK performed site-specific analyses for loss of coolant inventory events for the SFP. These analyses show that after the spent fuel has decayed for 17 months for events in which the SFP is drained, air cooling will prevent the fuel from reaching the lowest temperature at which incipient cladding failure may occur (565°C). In the event that air cooling is not possible, a minimum of 10 hours is available from the time the fuel is uncovered until it reaches a temperature of 900°C to initiate mitigative actions consistent with plant conditions, and if necessary, for offsite authorities to implement protective actions using a CEMP approach.

NUREG-2161 (Reference 7) states that, "this study's results are consistent with earlier research studies' conclusions that spent fuel pools are robust structures that are likely to withstand severe earthquakes without leaking cooling water and potentially uncovering the spent fuel. The study shows the likelihood of a radiological release from the spent fuel after the analyzed severe earthquake at the reference plant to be about one time in 10 million years or lower. If a leak and radiological release were to occur, this study shows that the individual cancer fatality risk for a member of the public is several orders of magnitude lower than the Commission's Quantitative Health Objective of two in one million (2×10^{-6} /year). For such a radiological release, this study shows public and environmental effects are generally the same or smaller than earlier studies." The reference plant for the study [*General Electric Type 4 BWR with a Mark I containment*] generated approximately 3500 MWt and the SFP contained 2844 fuel assemblies. DEK provided that KPS generated 1772 MWt, and its SFP contains 1079 fuel assemblies. The reference plant also had an elevated SFP, whereas KPS's SFP is at or below ground level. Based on these differences, the staff believes the risk and the consequences of an event involving the SFP at the KPS are lower than those in the NUREG-2161 study.

DEK's analyses determined that if all cooling were lost as of September 20, 2014, the SFP at the KPS would take 5 days to boil, and total of 26 days for the water inventory to reach a level of three feet from the top of the fuel due to boil off. Additionally, it concluded that as of October 30, 2014, in the event of a complete loss of SFP water inventory, peak fuel clad temperature would be less than 565°C due to natural circulation of air through the spent fuel racks. At this temperature, the fuel cladding remains intact and any radiological release from the fuel would not occur.

Exemptions from offsite EP requirements have previously been approved when the site-specific analyses show that at least 10 hours is available from a partial drain-down event where cooling of the spent fuel is not effective until the hottest fuel assembly reaches 900°C. The staff concluded that if 10 hours were available to initiate mitigative actions consistent with plant conditions, or if needed, to implement offsite protective actions using a CEMP, formal offsite radiological emergency plans are not necessary for these permanently defueled nuclear power reactor licensees. DEK provided analysis of uncovered spent fuel with no air cooling possible (adiabatic heat up) at KPS (Reference 17). The results of the calculations are that as of October 21, 2014, it would take 10 hours to reach the runaway oxidation temperature for zirconium of 900°C.

Additionally, DEK committed to enhanced SFP makeup strategies in Attachment 2 of its letter dated August 23, 2013 (Reference 22). The multiple strategies for providing makeup to the SFP include: using existing plant systems for inventory makeup; supplying water through hoses to a spool piece connection to the existing SFP piping; or using a diesel-driven portable pump to take suction from Lake Michigan and provide makeup or spray to the SFP. These strategies will continue to be required as a license condition. DEK further provides that the equipment needed to perform these actions will continue to be located onsite, and that the external makeup strategy (using a diesel driven portable pump) is capable of being deployed within 2 hours. DEK believes that, considering the very low probability of beyond-DBAs affecting the SFP, these diverse strategies provide defense-in-depth and time to provide makeup or spray to the SFP before the onset of any postulated offsite radiological releases.

For all the reasons stated, and consistent with the NRC staff's regulatory evaluation basis in Section 2.0, the staff finds the licensee's requested exemptions to meet the underlying purpose of the planning standards in 10 CFR 50.47(b) and requirements in Appendix E to Part 50, and acceptably satisfies the special circumstances in 10 CFR 50.12(a)(2)(ii) in view of the greatly reduced risk of offsite radiological consequences associated with the permanently shutdown and defueled state of the plant.

(4.1.2) 10 CFR 50.47(b)(1)

Primary responsibilities for emergency response by the nuclear facility licensee and by State and local organizations ~~within the Emergency Planning Zones~~ have been assigned, the emergency responsibilities of the various supporting organizations have been specifically established, and each principal response organization has staff to respond and to augment its initial response on a continuous basis.

NUREG-0396, "Planning Basis for the Development of State and Local Government Radiological Emergency Response Plans in Support of Light Water Nuclear Power Plants," dated November 1978 (Reference 23), provided that emergency response plans should be useful for responding to any accident that would produce offsite radiological doses in excess of

the EPA PAGs. Additionally, it introduced the concept of generic EPZs as a basis for the planning of response actions which would result in dose savings in the environs of nuclear facilities in the event of a serious power reactor accident. As previously discussed in Section 4.1.1, DEK has provided revised radiological analyses that show that, 90 days after shut down, the radiological consequences for applicable DBAs at KPS will not exceed the limits of the EPA PAGs at the EAB. Based on the above assessment and the assessment in Section 4.1.1, the NRC staff concludes that KPS is exempt from the requirement of 10 CFR 50.47(b)(1) specifying "within the Emergency Planning Zones."

(4.1.3) 10 CFR 50.47(b)(3)

Arrangements for requesting and effectively using assistance resources have been made, ~~arrangements to accommodate State and local staff at the licensee's Emergency Operations Facility have been made~~, and other organizations capable of augmenting the planned response have been identified.

The NRC requires a level of licensee EP commensurate with the potential consequences to public health and safety and common defense and security at the licensee's site. With the termination of reactor operations at KPS and the permanent removal of the fuel from the reactor core, most of the accident scenarios postulated for operating reactors are no longer possible. The irradiated fuel is now stored in either the SFP or the KPS ISFSI, and will remain onsite until it can be moved offsite for long-term storage or disposal. The reactor, reactor coolant system (RCS), and secondary system are no longer in operation and have no function related to the storage or the irradiated fuel. Therefore postulated accidents involving failure or malfunction of the reactor, RCS, or supporting systems are no longer applicable. During reactor decommissioning, the principal public safety concerns involve the perceived radiological risks associated with the storage of spent fuel onsite. As such, a separate emergency operations facility would not be required. Onsite operations staff will continue to maintain and provide for communication and coordination capabilities with offsite organizations for the level of support required for remaining DBAs and the prompt implementation of mitigative actions in response to a SFP accident.

Based on the above assessment and the assessment provided in Section 4.1.1, the NRC staff concludes that KPS is exempt from the requirement of 10 CFR 50.47(b)(3) that "arrangements to accommodate State and local staff at the licensee's Emergency Operations Facility have been made."

(4.1.4) 10 CFR 50.47(b)(4)

A standard emergency classification and action level scheme, the bases of which include facility system and effluent parameters, is in use by the nuclear facility licensee, ~~and State and local response plans call for reliance on information provided by facility licensees for determinations of minimum initial offsite response measures.~~

The NRC requires a level of licensee EP commensurate with the potential consequences to public health and safety, and common defense and security at the licensee's site. DEK's exemption request included radiological analyses to show that, 90 days after shutdown, the radiological consequences of DBAs will not exceed the limits of the EPA PAGs at the EAB. As discussed previously, DEK furnished information to supplement its exemption request concerning its SFP inventory makeup strategies. Considering the very low-probability of beyond-DBAs affecting the SFP, and with the time available to initiate mitigative actions

consistent with plant conditions or, if needed, implementation of protective actions by offsite authorities using a CEMP approach between the initiating event and before the onset of a postulated zirconium cladding fire, offsite radiological emergency plans are not needed. Therefore, reliance on information provided by KPS for initial offsite response measures, based on emergency classification, would not be required.

Based on the above assessment and the assessment provided in Section 4.1.1 the NRC staff concludes that KPS is exempt from the requirement in 10 CFR 50.47(b)(4) that "State and local response plans call for reliance on information provided by facility licensees for determinations of minimum initial offsite response measures."

(4.1.5) 10 CFR 50.47(b)(5)

Procedures have been established for notification, by the licensee, of State and local response organizations and for notification of emergency personnel by all organizations; the content of initial and followup messages to response organizations **and the public** has been established; ~~and means to provide early notification and clear instruction to the populace within the plume exposure pathway Emergency Planning Zone have been established.~~

The NRC requires a level of licensee EP commensurate with the potential consequences to public health and safety, and common defense and security at the licensee's site. DEK's exemption request included radiological analyses to show that, 90 days after shutdown, the radiological consequences of DBAs will not exceed the limits of the EPA PAGs at the EAB. Unlike operating reactor accident sequences potentially leading to a large early release, accident scenarios at decommissioning plant SFPs evolve slowly and provide a longer time period to deal with both SFP mitigative actions or protective actions, including public evacuation if necessary. As discussed previously, DEK furnished information to supplement its exemption request concerning its SFP inventory makeup strategies. Considering the very low probability of beyond design-basis events affecting the SFP, and with the time available to initiate mitigative actions consistent with plant conditions or, if needed, implementation of protective actions by offsite authorities using a CEMP approach between the initiating event and before the onset of a postulated zirconium cladding fire, offsite radiological emergency plans are not needed. Therefore, a means to provide early notification and clear instruction to the populace within a designated plume exposure pathway EPZ is not required.

Based on the above assessment and the assessment provided in Section 4.1.1 the NRC staff concludes that KPS is exempt from the requirements in 10 CFR 50.47(b)(5) for "and the public," and "means to provide early notification and clear instruction to the populace within the plume exposure pathway Emergency Planning Zone have been established."

(4.1.6) 10 CFR 50.47(b)(6)

Provisions exist for prompt communications among principal response organizations to emergency personnel ~~and to the public.~~

The NRC requires a level of licensee EP commensurate with the potential consequences to public health and safety and common defense and security at the licensee's site. DEK's exemption request included radiological analyses to show that, 90 days after shutdown, the radiological consequences of DBAs will not exceed the limits of the EPA PAGs at the EAB.

Unlike operating reactor accident sequences potentially leading to a large early release, accident scenarios at decommissioning plant SFPs evolve slowly and provide a longer time period to deal with both SFP mitigative actions or protective actions, including public evacuation if necessary. As discussed previously, DEK furnished information to supplement its exemption request concerning its SFP inventory makeup strategies. Considering the very low-probability of beyond-design-basis events affecting the SFP, and with the time available to initiate mitigative actions consistent with plant conditions or, if needed, implementation of protective actions by offsite authorities using a CEMP approach between the initiating event and before the onset of a postulated zirconium cladding fire, offsite radiological emergency plans are not needed. Therefore, the requirement to provide prompt communication to the public in regards to initial or pre-determined protective actions is not required.

Based on the above assessment and the assessment provided in Section 4.1.1 the NRC staff concludes that KPS is exempt from the requirements in 10 CFR 50.47(b)(6) to provide prompt communications "to the public."

(4.1.7) 10 CFR 50.47(b)(7)

~~Information is made available to the public on a periodic basis on how they will be notified and what their initial actions should be in an emergency (e.g., listening to a local broadcast station and remaining indoors),~~ (T)he principal points of contact with the news media for dissemination of information during an emergency ~~(including the physical location or locations)~~ are established in advance, and procedures for coordinated dissemination of information to the public are established.

The NRC requires a level of licensee EP commensurate with the potential consequences to public health and safety and common defense and security at the licensee's site. DEK's exemption request included radiological analyses to show that 90 days after shutdown, the radiological consequences of DBAs will not exceed the limits of the EPA PAGs at the exclusion area boundary. Unlike operating reactor accident sequences potentially leading to a large early release, accident scenarios at decommissioning plant SFPs evolve slowly and provide a longer time period to deal with both SFP mitigative actions or protective actions, including public evacuation if necessary. As discussed previously, DEK furnished information to supplement its exemption request concerning its SFP inventory makeup strategies. Considering the very low-probability of beyond-design-basis events affecting the SFP, and with the time available to initiate mitigative actions consistent with plant conditions or if needed, implementation of protective actions by offsite authorities using a CEMP approach between the initiating event and before the onset of a postulated fire, offsite radiological emergency plans are not needed. Therefore, the requirement to provide periodic information to the public on how they will be notified and what their initial or pre-determined protective actions should be in an emergency is not required.

Based on the above assessment and the assessment provided in Section 4.1.1 the NRC staff concludes that KPS is exempt from the requirements of 10 CFR 50.47(b)(7) that "Information is made available to the public on a periodic basis on how they will be notified and what their initial actions should be in an emergency (e.g., listening to a local broadcast station and remaining indoors)," and "including the physical location or locations" of points of contact with the news media.

(4.1.8) 10 CFR 50.47(b)(9)

Adequate methods, systems, and equipment for assessing and monitoring actual or potential **offsite** consequences of a radiological emergency condition are in use.

The NRC requires a level of licensee EP commensurate with the potential consequences to public health and safety and common defense and security at the licensee's site. DEK's exemption request included radiological analyses to show that 90 days after shutdown, the radiological consequences of DBAs will not exceed the limits of the EPA PAGs at the exclusion area boundary. As discussed previously, DEK furnished information to supplement its exemption request concerning its SFP inventory makeup strategies. Considering the very low-probability of beyond-design-basis events affecting the SFP, and with the time available to initiate mitigative actions consistent with plant conditions or if needed, implementation of protective actions by offsite authorities using a CEMP approach between the initiating event and before the onset of a postulated fire, offsite radiological emergency plans are not needed. Therefore, the requirement for assessing or monitoring offsite consequences beyond the EAB is not required.

Based on the above assessment and the assessment provided in Section 4.1.1 the NRC staff concludes that KPS is exempt from the requirements in 10 CFR 50.47(b)(9) related to assessing and monitoring actual or potential "offsite" consequences of a radiological emergency condition.

(4.1.9) 10 CFR 50.47(b)(10)

DEK requested the following:

~~A range of protective actions has been developed for the plume exposure pathway EPZ for emergency workers and the public. In developing this range of actions, consideration has been given to evacuation, sheltering, and, as a supplement to these, the prophylactic use of potassium iodide (KI), as appropriate. Evacuation time estimates have been developed by applicants and licensees. Licensees shall update the evacuation time estimates on a periodic basis. Guidelines for the choice of protective actions during an emergency, consistent with Federal guidance, are developed and in place, and protective actions for the ingestion exposure pathway EPZ appropriate to the locale have been developed.~~

The NRC staff grants:

~~A range of protective actions has been developed for the plume exposure pathway EPZ for emergency workers and the public. In developing this range of actions, consideration has been given to evacuation, sheltering, and, as a supplement to these, the prophylactic use of potassium iodide (KI), as appropriate. Evacuation time estimates have been developed by applicants and licensees. Licensees shall update the evacuation time estimates on a periodic basis. Guidelines for the choice of protective actions during an emergency, consistent with Federal guidance, are developed and in place, and protective actions for the ingestion exposure pathway EPZ appropriate to the locale have been developed.~~

The NRC requires a level of licensee EP commensurate with the potential consequences to public health and safety and common defense and security at the licensee's site. DEK's exemption request included radiological analyses to show that 90 days after shutdown, the

radiological consequences of DBAs will not exceed the limits of the EPA PAGs at the exclusion area boundary. As discussed previously, DEK furnished information to supplement its exemption request concerning its SFP inventory makeup strategies. Considering the very low-probability of beyond-design-basis events affecting the SFP, and with the time available to initiate mitigative actions consistent with plant conditions or, if needed, implementation of protective actions by offsite authorities using a CEMP approach between the initiating event and before the onset of a postulated fire, offsite radiological emergency response plans are not needed. Additionally, in the unlikely event of an SFP accident, the iodine isotopes, which contribute to an offsite dose from an operating reactor accident, are not present, so potassium iodide (KI) distribution would no longer serve as an effective or necessary supplemental protective action. Therefore, the requirement for an EPZ, and the need for associated protective actions developed from evacuation time estimates (ETE) are no longer required.

The 2011 EP Final Rule, "Enhancements to Emergency Preparedness Regulations," published in the *Federal Register* (FR) (76 FR 72560) on November 23, 2011 (Reference 24), changed the regulation by adding to 10 CFR 50.47(b)(10) the requirements, "Evacuation time estimates have been developed by applicants and licensees. Licensees shall update the evacuation time estimates on a periodic basis." These requirements to develop and update an ETE are primarily used to inform offsite protective action decision-making.

Although exemptions from offsite radiological emergency preparedness plans have typically been granted for decommissioning sites, offsite organizations continue to be relied upon for firefighting, law enforcement, ambulance and medical services in support of the licensee's (onsite) emergency plan. Additionally, the licensee is responsible for control of activities in the Exclusion Area, including public access. Based on this, the NRC staff is maintaining the requirements that "A range of protective actions has been developed" and "for emergency workers and the public" within the licensee's EAB.

Based on the above assessment and the assessment provided in Section 4.1.2, the NRC staff concludes that KPS is exempt from the requirements of 10 CFR 50.47(b)(10) for: "plume exposure pathway EPZ for" and "In developing this range of actions, consideration has been given to evacuation, sheltering, and, as a supplement to these, the prophylactic use of potassium iodide (KI), as appropriate. Evacuation time estimates have been developed by applicants and licensees. Licensees shall update the evacuation time estimates on a periodic basis. Guidelines for the choice of protective actions during an emergency, consistent with Federal guidance, are developed and in place, and protective actions for the ingestion exposure pathway EPZ appropriate to the locale have been developed."

(4.1.10) 10 CFR 50.47(c)(2)

Generally, the plume exposure pathway EPZ for nuclear power plants shall consist of an area about 10 miles (16 km) in radius and the ingestion pathway EPZ shall consist of an area about 50 miles (80 km) in radius. The exact size and configuration of the EPZs surrounding a particular nuclear power reactor shall be determined in relation to local emergency response needs and capabilities as they are affected by such conditions as demography, topography, land characteristics, access routes, and jurisdictional boundaries. The size of the EPZs also may be determined on a case-by-case basis for gas-cooled nuclear reactors and for reactors with an authorized power level less than 250 MW thermal. **The plans for the ingestion pathway shall focus on such actions as are appropriate to protect the food ingestion pathway.**

Based on the assessment in Section 4.1.2, the NRC staff concluded that KPS is exempted from the requirement to have an EPZ. Therefore, the requirements in 10 CFR 50.47(c)(2) for: "Generally, the plume exposure pathway EPZ for nuclear power plants shall consist of an area about 10 miles (16 km) in radius and the ingestion pathway EPZ shall consist of an area about 50 miles (80 km) in radius. The exact size and configuration of the EPZs surrounding a particular nuclear power reactor shall be determined in relation to local emergency response needs and capabilities as they are affected by such conditions as demography, topography, land characteristics, access routes, and jurisdictional boundaries," and "The plans for the ingestion pathway shall focus on such actions as are appropriate to protect the food ingestion pathway" of 10 CFR 50.47(c)(2). "The size of the EPZs also may be determined on a case-by-case basis for gas-cooled nuclear reactors and for reactors with an authorized power level less than 250 MW thermal" are not applicable to KPS, and therefore, requires no exemption.

4.2 Specific Exemptions for 10 CFR Part 50, Appendix E, Section IV

DEK's letter dated July 31, 2013 (Reference 3), requested exemptions for KPS from certain sections of Appendix E to 10 CFR 50 (as indicated in the following evaluation by strikeout and bolded text). Based upon the NRC staff's initiative, there are several differences in the exemption language that DEK requested and the exemption language that is being granted by this exemption. These differences are based on maintaining consistency with previous precedent and enhancements identified during the review process.

(4.2.1) 10 CFR Part 50, Appendix E, Section IV.1

The applicant's emergency plans shall contain, but not necessarily be limited to, information needed to demonstrate compliance with the elements set forth below, i.e., organization for coping with radiological emergencies, assessment actions, activation of emergency organization, notification procedures, emergency facilities and equipment, training, maintaining emergency preparedness, recovery, **and onsite protective actions during hostile action.** In addition, the emergency response plans submitted by an applicant for a nuclear power reactor operating license under this part, or for an early site permit (as applicable) or combined license under 10 CFR part 52, shall contain information needed to demonstrate compliance with the standards described in § 50.47(b), and they will be evaluated against those standards.

In the 2011 EP Final Rule (Reference 24), the Commission defined "hostile action" as, in part, an act directed toward a nuclear power plant or its personnel. The NRC excluded non-power reactors from the scope of "hostile action" at the time of the rulemaking because, as defined in 10 CFR 50.2, a non-power reactor is not considered a nuclear power reactor and a regulatory basis had not been developed to support the inclusion of non-power reactors in the scope of "hostile action." Similarly, a decommissioning power reactor or ISFSI is not a "nuclear reactor" as defined in 10 CFR Part 50. A decommissioning power reactor also has a low likelihood of a credible accident resulting in an offsite radiological release requiring protective measures. Similarly, for security, risk insights can be used to determine which targets are important to protect against sabotage. A level of security commensurate with the consequences of a sabotage event is required and is evaluated on a site-specific basis. The severity of the consequences declines as fuel ages and, thereby, removes over time the underlying concern that a sabotage attack could cause offsite radiological consequences. For these reasons, the NRC staff concludes that a decommissioning power reactor is not a facility that falls within the scope of "hostile action" In regards to the need for pre-determined protective actions.

Although, this assessment provides a justification for exempting KPS from "hostile action" related requirements, some EP requirements for security-based events are maintained. The classification of security-based events, notification of offsite authorities, and coordination with offsite agencies under a CEMP concept are still required.

Based on the above assessment, the NRC staff concludes that KPS is exempt from the requirement in 10 CFR Part 50, Appendix E, Section IV.1 for "onsite protective actions during hostile action."

(4.2.2) 10 CFR Part 50, Appendix E, Section IV.2

~~This nuclear power reactor license applicant shall also provide an analysis of the time required to evacuate various sectors and distances within the plume exposure pathway EPZ for transient and permanent populations using the most recent U.S. Census Bureau data as of the date the applicant submits its application to the NRC.~~

Based on the assessment in Section 4.1.9, the staff concluded that KPS is exempt from the requirement to have an EPZ; therefore, KPS is exempt from the requirements in 10 CFR Part 50, Appendix E, Section IV.2.

(4.2.3) 10 CFR Part 50, Appendix E, Section IV.3

~~Nuclear power reactor licensees shall use NRC approved evacuation time estimates (ETEs) and updates to the ETEs in the formulation of protective action recommendations and shall provide the ETEs and ETE updates to State and local governmental authorities for use in developing offsite protective action strategies.~~

Based on the assessment in Section 4.1.9, the staff concluded that KPS is exempt from the requirement to have an EPZ; therefore, KPS is exempt from the requirements in 10 CFR Part 50, Appendix E, Section IV.3.

(4.2.4) 10 CFR Part 50, Appendix E, Section IV.4

~~Within 365 days of the later of the date of the availability of the most recent decennial census data from the U.S. Census Bureau or December 23, 2011, nuclear power reactor licensees shall develop an ETE analysis using this decennial data and submit it under § 50.4 to the NRC. These licensees shall submit this ETE analysis to the NRC at least 180 days before using it to form protective action recommendations and providing it to State and local governmental authorities for use in developing offsite protective action strategies.~~

Based on the assessment in Section 4.1.9, the staff concluded that KPS is exempt from the requirement to have an EPZ; therefore, KPS is exempt from the requirements in 10 CFR Part 50, Appendix E, Section IV.4.

(4.2.5) 10 CFR Part 50, Appendix E, Section IV.5

~~During the years between decennial censuses, nuclear power reactor licensees shall estimate EPZ permanent resident population changes once a year, but no later than 365 days from the date of the previous estimate, using the most recent U.S. Census Bureau annual resident population estimate and State/local government population data, if available. These licensees shall maintain these estimates so that they are available for NRC inspection during the period between decennial censuses and shall submit these estimates to the NRC with any updated ETE analysis.~~

Based on the assessment in Section 4.1.9, the staff concluded that KPS is exempt from the requirement to have an EPZ; therefore, KPS is exempt from the requirements in 10 CFR Part 50, Appendix E, Section IV.5.

(4.2.6) 10 CFR Part 50, Appendix E, Section IV.6

~~If at any time during the decennial period, the EPZ permanent resident population increases such that it causes the longest ETE value for the 2-mile zone or 5-mile zone, including all affected Emergency Response Planning Areas, or for the entire 10-mile EPZ to increase by 25 percent or 30 minutes, whichever is less, from the nuclear power reactor licensee's currently NRC approved or updated ETE, the licensee shall update the ETE analysis to reflect the impact of that population increase. The licensee shall submit the updated ETE analysis to the NRC under § 50.4 no later than 365 days after the licensee's determination that the criteria for updating the ETE have been met and at least 180 days before using it to form protective action recommendations and providing it to State and local governmental authorities for use in developing offsite protective action strategies.~~

Based on the assessment in Section 4.1.9, the staff concluded that KPS is exempt from the requirement to have an EPZ; therefore, KPS is exempt from the requirements in 10 CFR Part 50, Appendix E, Section IV.6.

(4.2.7) 10 CFR Part 50, Appendix E, Section IV.A.1

DEK requested the following:

A description of the normal plant operating organization. (no exemption requested)

The NRC staff grants:

A description of the normal plant **operating** organization.

Based on the permanently shutdown and defueled status of the reactor, a decommissioning reactor is not authorized to operate under 10 CFR 50.82(a). Because the licensee cannot operate the reactors, the licensee does not have a "plant operating organization." Based on this reason the staff concludes that KPS is exempt from the requirement to describe an "operating" organization in 10 CFR Part 50, Appendix E, Section IV.A.1.

Although DEK did not specifically request an exemption for the word "operating," the NRC staff considers this difference to be editorial only and grants the exemption as written to maintain consistency with the exemption language of the previously granted exemptions.

(4.2.8) 10 CFR Part 50, Appendix E, Section IV.A.3

~~A description, by position and function to be performed, of the licensee's headquarters personnel who will be sent to the plant site to augment the onsite emergency organization.~~

The number of staff at decommissioning sites is generally smaller than that for an operating power reactor, but is still commensurate with the need to safely store spent fuel at the facility in a manner that is protective of public health and safety. Decommissioning sites typically have a level of emergency response that does not require response by the licensee's headquarters personnel. However, this does not preclude a licensee from continuing to use headquarters or other corporate personnel to augment the onsite emergency organization. Based on this reason, the NRC staff concludes that KPS is exempt from the requirements of 10 CFR Part 50, Appendix E, Section IV.A.3.

(4.2.9) 10 CFR Part 50, Appendix E, Section IV.A.4

Identification, by position and function to be performed, of persons within the licensee organization who will be responsible for making **offsite** dose projections, and a description of how these projections will be made and the results transmitted to State and local authorities, NRC, and other appropriate governmental entities.

Although, the likelihood of events that would result in doses in excess of the EPA PAGs to the public beyond the owner controlled area boundary based on the permanently shutdown and defueled status of the reactor is extremely low, the licensee still must be able to determine if a radiological release is occurring. If a release is occurring, then the licensee staff should promptly communicate that information to offsite authorities for their consideration. The offsite organizations are responsible for deciding what, if any, protective actions should be taken based on a CEMP approach, rather than that based on detailed offsite radiological emergency plan.

Based on the above assessment and the assessment in Section 4.1.1, the NRC staff concludes that KPS is exempt from the requirement in 10 CFR Part 50, Appendix E, Section IV.A.4 for identification of persons within the licensee organization who will be responsible for making "offsite" dose projections beyond facilities EAB.

(4.2.10) 10 CFR Part 50, Appendix E, Section IV.A.5

~~Identification, by position and function to be performed, of other employees of the licensee with special qualifications for coping with emergency conditions that may arise. Other persons with special qualifications, such as consultants, who are not employees of the licensee and who may be called upon for assistance for emergencies shall also be identified. The special qualifications of these persons shall be described.~~

The number of staff at decommissioning sites is generally smaller than that for an operating power reactor, but is still commensurate with the need to operate the facility in a manner that is protective of public health and safety. The NRC staff considered the similarity between the staffing levels at a permanently shutdown and defueled reactor and staffing levels at an operating power reactor site, since the spectrum of accidents at a decommissioning facility is greatly reduced requiring less specialized qualifications. The minimal systems and equipment needed to maintain the spent nuclear fuel in the SFP, or in a dry cask storage system in a safe condition requires minimal personnel, is governed by Technical Specifications. As such, additional employees or other persons with special qualifications is not anticipated.

Based on the above assessment and the assessment provided in Section 4.2.8, the NRC staff concludes that KPS is exempt from the requirements in 10 CFR Part 50, Appendix E, Section IV.A.5.

(4.2.11) 10 CFR 50, Appendix E, Section IV.A.7

DEK requested the following:

~~By June 23, 2014, identification of, and a description of the assistance expected from, appropriate State, local, and Federal agencies with responsibilities for coping with emergencies, including hostile action at the site. For purposes of this appendix, "hostile action" is defined as an act directed toward a nuclear power plant or its personnel that includes the use of violent force to destroy equipment, take hostages, and/or intimidate the licensee to achieve an end. This includes attack by air, land, or water using guns, explosives, projectiles, vehicles, or other devices used to deliver destructive force.~~

The NRC staff grants:

~~By June 23, 2014, identification of, and a description of the assistance expected from, appropriate State, local, and Federal agencies with responsibilities for coping with emergencies, including hostile action at the site. For purposes of this appendix, "hostile action" is defined as an act directed toward a nuclear power plant or its personnel that includes the use of violent force to destroy equipment, take hostages, and/or intimidate the licensee to achieve an end. This includes attack by air, land, or water using guns, explosives, projectiles, vehicles, or other devices used to deliver destructive force.~~

Although the NRC has previously exempted decommissioning reactors from "hostile action" enhancements, based on the applicability of the 2011 EP rule (Reference 24) (as stated in the Statement of Considerations (SOC)), the licensee's physical security plan must continue to provide high assurance against a potential security event impacting a designated target set. Therefore, some EP requirements for security-based events are maintained, such as the classification of security-based events, notification of offsite authorities, and coordination for the response of offsite organizations (i.e., law enforcement, firefighting, medical assistance) onsite.

Based on the above assessment and the assessment provided in Section 4.2.1, the NRC staff concludes that KPS is exempt from the requirements: "By June 23, 2014," "a description of the," and "including hostile action at the site. For purposes of this appendix, 'hostile action' is defined as," in 10 CFR Part 50, Appendix E, Section IV.A.7.

(4.2.12) 10 CFR 50, Appendix E, Section IV.A.8

~~Identification of the State and/or local officials responsible for planning for, ordering, and controlling appropriate protective actions, including evacuations when necessary.~~

For a decommissioning facility, offsite emergency measures are limited to support provided by local police, fire departments, and ambulance and hospital services, responding onsite. Due to the low probability of DBAs or other credible events to exceed the EPA PAGs, and slow progression and long time period available to deal with both the accident, pre-planned protective actions, such as evacuation, under formal radiological emergency plans are not required, but could be implemented at the discretion of offsite authorities using a CEMP approach.

Based on the above assessment and the assessment provided in Section 4.1.1, the NRC staff concludes that KPS is exempt from the requirements in 10 CFR Part 50, Appendix E, Section IV.A.8.

(4.2.13) 10 CFR Part 50, Appendix E, Section IV.A.9

~~By December 24, 2012, for nuclear power reactor licensees, a detailed analysis demonstrating that on-shift personnel assigned emergency plan implementation functions are not assigned responsibilities that would prevent the timely performance of their assigned functions as specified in the emergency plan.~~

Responsibilities should be well defined in the emergency plan and procedures, regularly tested through drills and exercises that are audited by the licensee and inspected by the NRC. The duties of the on-shift personnel at a decommissioning reactor facility are not as complicated and diverse as those for an operating power reactor.

The NRC staff considered the similarity between the staffing levels at a permanently shutdown and defueled reactor and staffing levels at an operating power reactor site. The minimal systems and equipment needed to maintain the spent nuclear fuel in the SFP or in a dry cask storage system in a safe condition requires minimal personnel and is governed by Technical Specifications. In the 2011 EP Rule, the NRC concluded that the staffing analysis requirement was not necessary for non-power reactor licensees due to the small staffing levels required to operate the facility.

The NRC staff also examined the actions required to mitigate the very low probability design-basis events for the SFP. Additionally, DEK also furnished information on its SFP inventory makeup strategies for mitigating the loss of water inventory. The multiple strategies for providing makeup to the SFP include: using existing plant systems for inventory makeup; supplying water via hoses to a spool piece connection to the existing SFP piping; or using a diesel-driven portable pump to take suction from Lake Michigan and provide makeup or spray to the SFP. DEK further provided that the tools and equipment needed to perform these actions are located on site and the external makeup strategy (using a diesel driven portable pump) was demonstrated to be capable of being deployed within 2 hours, significantly less time than the 10 hours that would be available for ad hoc response. DEK believes, and the NRC staff agrees, that these diverse strategies provide defense-in-depth and ample time to provide makeup or spray to the SFP prior to the onset of zirconium cladding ignition when considering very low probability beyond design-basis accidents affecting the SFP.

Based on the above assessment, the NRC staff concludes that KPS is exempt from the requirement of 10 CFR Part 50, Appendix E, Section IV.A.9.

(4.2.14) 10 CFR Part 50, Appendix E, Section IV.B.1

DEK requested the following:

The means to be used for determining the magnitude of, and for continually assessing the impact of, the release of radioactive materials shall be described, including emergency action levels that are to be used as criteria for determining the need for notification and participation of local and State agencies, the Commission, and other Federal agencies, and the emergency action levels that are to be used for determining when and what type of protective measures should be considered within **and outside** the site boundary to protect health and safety. The emergency action levels shall be based on in-plant conditions and instrumentation in addition to onsite **and offsite** monitoring. ~~By June 20, 2012, for nuclear power reactor licensees, these action levels must include hostile action that may adversely affect the nuclear power plant.~~ The initial emergency action levels shall be discussed and agreed on by the applicant or licensee and State and local governmental authorities, and approved by the NRC. ~~Thereafter,~~ emergency action levels shall be reviewed with the State and local governmental authorities on an annual basis.

The NRC staff grants:

The means to be used for determining the magnitude of, and for continually assessing the impact of, the release of radioactive materials shall be described, including emergency action levels that are to be used as criteria for determining the need for notification and participation of local and State agencies, the Commission, and other Federal agencies, and the emergency action levels that are to be used for determining when and what type of protective measures should be considered within **and outside** the site boundary to protect health and safety. The emergency action levels shall be based on in-plant conditions and instrumentation in addition to onsite **and offsite** monitoring. ~~By June 20, 2012, for nuclear power reactor licensees, these action levels must include hostile action that may adversely affect the nuclear power plant.~~ The initial emergency action levels shall be discussed and agreed on by the applicant or licensee and State and local governmental authorities, and approved by the

NRC. Thereafter, emergency action levels shall be reviewed with the State and local governmental authorities on an annual basis.

Although DEK did request an exemption for the word "Thereafter," the NRC staff considers this difference as editorial in nature and grants the exemption as written to maintain consistency with the exemption language of the previously granted exemptions.

Based on the above assessment and the assessment provided in Sections 4.1.1 and 4.2.1, the NRC staff concludes that KPS is exempt from the requirements "and outside," "and offsite" and "By June 20, 2012, for nuclear power reactor licensees, these action levels must include hostile action that may adversely affect the nuclear power plant" in 10 CFR Part 50, Appendix E, Section IV.B.1.

(4.2.15) 10 CFR Part 50, Appendix E, Section IV.C.1

The entire spectrum of emergency conditions that involve the alerting or activating of progressively larger segments of the total emergency organization shall be described. The communication steps to be taken to alert or activate emergency personnel under each class of emergency shall be described. Emergency action levels (based not only on onsite ~~and offsite~~ radiation monitoring information but also on readings from a number of sensors that indicate a potential emergency, ~~such as the pressure in containment and the response of the Emergency Core Cooling System~~) for notification of offsite agencies shall be described. The existence, but not the details, of a message authentication scheme shall be noted for such agencies. The emergency classes defined shall include: (1) Notification of unusual events, (2) alert, ~~(3) site area emergency, and (4) general emergency~~. These classes are further discussed in NUREG-0654/FEMA-REP-1.

Containment parameters do not provide an indication of the conditions at a defueled facility and emergency core cooling systems are no longer required. Other indications, such as SFP level or temperature, can be used at sites where there is spent fuel in the SFPs.

In the SOC for the Final Rule for EP requirements for ISFSIs and for MRS facilities (60 FR 32430), the Commission responded to comments concerning a general emergency at an ISFSI and MRS, and concluded that, "...an essential element of a General Emergency is that a release can be reasonably expected to exceed EPA PAGs exposure levels off site for more than the immediate site area."

The probability of a condition reaching the level above an emergency classification of Alert is very low. In the event of an accident at a defueled facility that meets the conditions for relaxation of EP requirements, due to the slow progression of accident events there will be a long time period for mitigative or actions and, if needed, implementation of protective actions by offsite authorities using a CEMP approach.

Based on the above assessment and the assessment provided in Section 4.1.1, the NRC staff concludes that KPS is exempt from the requirements "offsite," "such as the pressure in containment and the response of the Emergency Core Cooling System" and "(3) site area emergency and (4) general emergency classifications" in 10 CFR Part 50, Appendix E, Section IV.C.1.

(4.2.16) 10 CFR 50, Appendix E, Section IV.C.2

DEK requested the following:

~~By June 20, 2012, nuclear power reactor~~ [L]icensees shall establish and maintain the capability to assess, classify, and declare an emergency condition ~~within 15 minutes~~ after the availability of indications to plant operators that an emergency action level has been exceeded and shall promptly declare the emergency condition as soon as possible following identification of the appropriate emergency classification level. Licensees shall not construe these criteria as a grace period to attempt to restore plant conditions to avoid declaring an emergency action due to an emergency action level that has been exceeded. Licensees shall not construe these criteria as preventing implementation of response actions deemed by the licensee to be necessary ~~to protect public health and safety provided that any delay in declaration does not deny the State and local authorities the opportunity to implement measures necessary to protect the public health and safety.~~

The NRC staff grants:

~~By June 20, 2012, nuclear power reactor~~ [L]icensees shall establish and maintain the capability to assess, classify, and declare an emergency condition ~~within 15 minutes~~ after the availability of indications to plant operators that an emergency action level has been exceeded and shall promptly declare the emergency condition as soon as possible following identification of the appropriate emergency classification level. Licensees shall not construe these criteria as a grace period to attempt to restore plant conditions to avoid declaring an emergency action due to an emergency action level that has been exceeded. Licensees shall not construe these criteria as preventing implementation of response actions deemed by the licensee to be necessary to protect public health and safety provided that any delay in declaration does not deny the State and local authorities the opportunity to implement measures necessary to protect the public health and safety.

In the 2011 EP rule (Reference 24), non-power reactor licensees were not required to assess, classify and declare an emergency condition within 15 minutes. Non-power reactors do not have the same potential impact on public health and safety as do power reactors and non-power reactor licensees do not require complex offsite emergency response activities. Similarly, a decommissioning power reactor has a low likelihood of a credible accident resulting in radiological releases requiring offsite protective measures. Unlike operating reactor accident sequences potentially leading to a large early release, accident scenarios at decommissioning plant SFPs evolve slowly and provide a longer time period to deal with both SFP mitigative actions or protective actions, including public evacuation if necessary. For these reasons, the NRC staff concludes that a decommissioning power reactor should not be required to assess, classify and declare an emergency condition within 15 minutes.

Although DEK did request an exemption for the wording "to protect public health and safety provided that any delay in declaration does not deny the State and local authorities the opportunity to implement measures necessary to protect the public health and safety," the NRC staff does not grant the exemption as proposed by DEK. While highly unlikely, the licensee must still ensure that timely communication exists with appropriate offsite response organizations for the possibility of an event leading to a significant offsite release. In the unlikely event that the SFP water inventory is catastrophically lost and air cooling is not possible, there

are 10 hours available from the time the fuel is uncovered until it reaches a temperature of 900°C to initiate mitigative actions consistent with plant conditions, and if necessary, for offsite authorities to employ their CEMP to implement protective actions.

Based on the above assessment and the assessment provided in Section 4.1.1, the NRC staff concludes that KPS is exempt from the requirements, "By June 20, 2012, nuclear power reactor" and "within 15 minutes," of 10 CFR Part 50, Appendix E, Section IV.C.2.

(4.2.17) 10 CFR 50, Appendix E, Section IV.D.1

DEK requested the following:

Administrative and physical means for notifying local, State, and Federal officials and agencies and agreements reached with these officials and agencies ~~for the prompt notification of the public and for public evacuation or other protective measures, should they become necessary,~~ shall be described. This description shall include identification ~~of the appropriate officials, by title and agency,~~ of the State and local government agencies ~~within the EPZs.~~

The NRC staff grants:

Administrative and physical means for notifying local, State, and Federal officials and agencies ~~and agreements reached with these officials and agencies for the prompt notification of the public and for public evacuation or other protective measures, should they become necessary,~~ shall be described. This description shall include identification ~~of the appropriate officials, by title and agency,~~ of the State and local government agencies ~~within the EPZs.~~

Although DEK did not request an exemption for the wording "and agreements reached with these officials and agencies," the NRC staff considers this difference to be editorial in nature and grants the exemption as written to maintain consistency with the exemption language of the previously granted exemptions.

Based on the assessment in Sections 4.1.9, the NRC staff concluded that KPS is exempt from the requirement to have an EPZ, therefore, KPS is exempt from the requirements "and agreements reached with these officials and agencies for the prompt notification of the public and for public evacuation or other protective measures, should they become necessary of the appropriate officials, by title and agency," and "within the EPZs" in 10 CFR 50, Appendix E, Section IV.D.1.

(4.2.18) 10 CFR 50, Appendix E, Section IV.D.2

~~Provisions shall be described for yearly dissemination to the public within the plume exposure pathway EPZ of basic emergency planning information, such as the methods and times required for public notification and the protective actions planned if an accident occurs, general information as to the nature and effects of radiation, and a listing of local broadcast stations that will be used for dissemination of information during an emergency. Signs or other measures shall also be used to disseminate to any transient population within the plume exposure pathway EPZ appropriate information that would be helpful if an accident occurs.~~

Based on the assessment in Sections 4.1.9 the NRC staff concluded that KPS is exempt from the requirement to have an EPZ, therefore, KPS is exempt from the requirements in 10 CFR 50, Appendix E, Section IV.D.2.

(4.2.19) 10 CFR 50, Appendix E, Section IV.D.3

DEK requested the following:

A licensee shall have the capability to notify responsible State and local governmental agencies ~~within 15 minutes~~ after declaring an emergency. ~~The licensee shall demonstrate that the appropriate governmental authorities have the capability to make a public alerting and notification decision promptly on being informed by the licensee of an emergency condition. Prior to initial operation greater than 5 percent of rated thermal power of the first reactor at the site, each nuclear power reactor licensee shall demonstrate that administrative and physical means have been established for alerting and providing prompt instructions to the public with the plume exposure pathway EPZ. The design objective of the prompt public alert and notification system shall be to have the capability to essentially complete the initial alerting and notification of the public within the plume exposure pathway EPZ within about 15 minutes. The use of this alerting and notification capability will range from immediate alerting and notification of the public (within 15 minutes of the time that State and local officials are notified that a situation exists requiring urgent action) to the more likely events where there is substantial time available for the appropriate governmental authorities to make a judgment whether or not to activate the public alert and notification system. The alerting and notification capability shall additionally include administrative and physical means for a backup method of public alerting and notification capable of being used in the event the primary method of alerting and notification is unavailable during an emergency to alert or notify all or portions of the plume exposure pathway EPZ population. The backup method shall have the capability to alert and notify the public within the plume exposure pathway EPZ, but does not need to meet the 15 minute design objective for the primary prompt public alert and notification system. When there is a decision to activate the alert and notification system, the appropriate governmental authorities will determine whether to activate the entire alert and notification system simultaneously or in a graduated or staged manner. The responsibility for activating such a public alert and notification system shall remain with the appropriate governmental authorities.~~

The NRC staff grants:

A licensee shall have the capability to notify responsible State and local governmental agencies ~~within 15 minutes~~ after declaring an emergency. ~~The licensee shall demonstrate that the appropriate governmental authorities have the capability to make a public alerting and notification decision promptly on being informed by the licensee of an emergency condition. Prior to initial operation greater than 5 percent of rated thermal power of the first reactor at the site, each nuclear power reactor licensee shall demonstrate that administrative and physical means have been established for alerting and providing prompt instructions to the public with the plume exposure pathway EPZ. The design objective of the prompt public alert and notification system shall be to have the capability to essentially complete the~~

~~initial alerting and notification of the public within the plume exposure pathway EPZ within about 15 minutes. The use of this alerting and notification capability will range from immediate alerting and notification of the public (within 15 minutes of the time that State and local officials are notified that a situation exists requiring urgent action) to the more likely events where there is substantial time available for the appropriate governmental authorities to make a judgment whether or not to activate the public alert and notification system. The alerting and notification capability shall additionally include administrative and physical means for a backup method of public alerting and notification capable of being used in the event the primary method of alerting and notification is unavailable during an emergency to alert or notify all or portions of the plume exposure pathway EPZ population. The backup method shall have the capability to alert and notify the public within the plume exposure pathway EPZ, but does not need to meet the 15 minute design objective for the primary prompt public alert and notification system. When there is a decision to activate the alert and notification system, the appropriate governmental authorities will determine whether to activate the entire alert and notification system simultaneously or in a graduated or staged manner. The responsibility for activating such a public alert and notification system shall remain with the appropriate governmental authorities.~~

Although DEK did request an exemption for the wording "within" and "minutes," the staff considers this difference to be editorial in nature and grants the exemption as written to maintain consistency with the exemption language of the previously granted exemptions.

While the capability needs to exist for the notification of offsite government agencies within a specified time period following an event declaration, previous exemptions have allowed for extending the State and local government agencies' notification time up to 60 minutes based on the site-specific justification provided. DEK's exemption request provides that the KPS will make notifications to the State of Wisconsin, to the local county (Kewaunee) and the NRC within 60 minutes of declaration of an event. In the permanently defueled condition of the reactor, the rapidly developing scenarios associated with events initiated during reactor power operation are no longer credible.

Based on the above assessment, and the assessment provided in Sections 4.1.1 and 4.1.2, the NRC staff concludes that KPS is exempt from the requirements of "15" and "the licensee shall demonstrate that the appropriate governmental authorities have the capability to make a public alerting and notification decision promptly on being informed by the licensee of an emergency condition. Prior to initial operation greater than 5 percent of rated thermal power of the first reactor at the site, each nuclear power reactor licensee shall demonstrate that administrative and physical means have been established for alerting and providing prompt instructions to the public with the plume exposure pathway EPZ. The design objective of the prompt public alert and notification system shall be to have the capability to essentially complete the initial alerting and notification of the public within the plume exposure pathway EPZ within about 15 minutes. The use of this alerting and notification capability will range from immediate alerting and notification of the public (within 15 minutes of the time that State and local officials are notified that a situation exists requiring urgent action) to the more likely events where there is substantial time available for the appropriate governmental authorities to make a judgment whether or not to activate the public alert and notification system. The alerting and notification capability shall additionally include administrative and physical means for a backup method of public alerting and notification capable of being used in the event the primary method of alerting and notification is unavailable during an emergency to alert or notify all or portions of the plume

exposure pathway EPZ population. The backup method shall have the capability to alert and notify the public within the plume exposure pathway EPZ, but does not need to meet the 15 minute design objective for the primary prompt public alert and notification system. When there is a decision to activate the alert and notification system, the appropriate governmental authorities will determine whether to activate the entire alert and notification system simultaneously or in a graduated or staged manner. The responsibility for activating such a public alert and notification system shall remain with the appropriate governmental authorities" in 10 CFR 50, Appendix E, Section IV.D.3.

(4.2.20) 10 CFR Part 50, Appendix E, Section IV.D.4

~~If FEMA has approved a nuclear power reactor site's alert and notification design report, including the backup alert and notification capability, as of December 23, 2011, then the backup alert and notification capability requirements in Section IV.D.3 must be implemented by December 24, 2012. If the alert and notification design report does not include a backup alert and notification capability or needs revision to ensure adequate backup alert and notification capability, then a revision of the alert and notification design report must be submitted to FEMA for review by June 24, 2013, and the FEMA-approved backup alert and notification means must be implemented within 365 days after FEMA approval. However, the total time period to implement a FEMA-approved backup alert and notification means must not exceed June 22, 2015.~~

Based on the assessment in Section 4.2.19, the NRC staff concluded that KPS is not required to have a backup alert and notification capability. Because the requirements in 10 CFR Part 50, Appendix E, Section IV.D.4 apply to a backup alert and notification capability, and KPS is exempt from the backup alert and notification capability requirement, the staff concludes that KPS is exempt from 10 CFR Part 50, Appendix E, Section IV.D.4.

(4.2.21) 10 CFR Part 50, Appendix E, Section IV.E 8.a.(i)

DEK requested the following:

A licensee onsite ~~technical support center and an emergency operations~~ facility from which effective direction can be given and effective control can be exercised during an emergency;

The NRC staff grants:

A licensee ~~onsite technical support center and an emergency operations~~ facility from which effective direction can be given and effective control can be exercised during an emergency;

Although DEK did not request an exemption for the word "onsite," the NRC staff considers this difference editorial in nature and grants the exemption as written to maintain consistency with the exemption language of the previously granted exemptions.

Due to the low probability of DBAs or other credible events to exceed the EPA PAGs at the site boundary, the available time for event mitigation at a decommissioning reactor and, if needed, to implement offsite protective actions using a CEMP approach, an emergency operations facility (EOF) would not be required to support offsite agency response. Onsite actions may be

directed from the control room or other location, without the requirements imposed on a technical support center (TSC) due to the reduced on-shift and ERO augmentation staffing required for a decommissioning facility.

Based on the above assessment and the assessment provided in Section 4.1.1, the staff concludes that KPS is exempt from the requirements in 10 CFR Part 50, Appendix E, Section IV.E.8.a.(i) for a "technical support center and an emergency operations" facility.

(4.2.22) 10 CFR 50, Appendix E, Section IV.E.8.a.(ii)

~~For nuclear power reactor licensees, a licensee onsite operational support center;~~

NUREG-0696, "Functional Criteria for Emergency Response Facilities," dated February 1981 (Reference 25), provides that the operational support center (OSC) is an onsite area separate from the control room and the TSC where licensee operations support personnel will assemble in an emergency. The OSC should provide a location where plant logistic support can be coordinated during an emergency and restrict control room access to those support personnel specifically requested by the shift supervisor.

Due to the reduced on-shift and ERO augmentation staffing required for a decommissioning facility, an operational support center is no longer required to meet its original purpose of an assembly area for plant logistical support during an emergency. Rather the designated control room, or command center, will provide facility for the continued coordination of emergency response activities.

Based on the above assessment, the NRC staff concludes that KPS is exempt from the requirement in 10 CFR Part 50, Appendix E, Section IV.E.8.a.(ii).

(4.2.23) 10 CFR 50, Appendix E, Section IV.E.8.b.

~~For a nuclear power reactor licensee's emergency operations facility required by paragraph 8.a of this section, either a facility located between 10 miles and 25 miles of the nuclear power reactor site(s), or a primary facility located less than 10 miles from the nuclear power reactor site(s) and a backup facility located between 10 miles and 25 miles of the nuclear power reactor site(s). An emergency operations facility may serve more than one nuclear power reactor site. A licensee desiring to locate an emergency operations facility more than 25 miles from a nuclear power reactor site shall request prior Commission approval by submitting an application for an amendment to its license. For an emergency operations facility located more than 25 miles from a nuclear power reactor site, provisions must be made for locating NRC and offsite responders closer to the nuclear power reactor site so that NRC and offsite responders can interact face-to-face with emergency response personnel entering and leaving the nuclear power reactor site. Provisions for locating NRC and offsite responders closer to a nuclear power reactor site that is more than 25 miles from the emergency operations facility must include the following:~~

~~(1) Space for members of an NRC site team and Federal, State, and local responders;~~

- ~~(2) Additional space for conducting briefings with emergency response personnel;~~
- ~~(3) Communication with other licensee and offsite emergency response facilities;~~
- ~~(4) Access to plant data and radiological information; and~~
- ~~(5) Access to copying equipment and office supplies;~~

Based on the assessment in Section 4.2.21, the NRC staff concluded that KPS is exempt from the requirement to have an EOF, therefore, KPS is exempt from the requirements in 10 CFR Part 50, Appendix E, Section IV.E.8.b.

(4.2.24) 10 CFR 50, Appendix E, Section IV.E.8.c.

~~By June 20, 2012, for a nuclear power reactor licensee's emergency operations facility required by paragraph 8.a of this section, a facility having the following capabilities:~~

- ~~(1) The capability for obtaining and displaying plant data and radiological information for each reactor at a nuclear power reactor site and for each nuclear power reactor site that the facility serves;~~
- ~~(2) The capability to analyze plant technical information and provide technical briefings on event conditions and prognosis to licensee and offsite response organizations for each reactor at a nuclear power reactor site and for each nuclear power reactor site that the facility serves; and~~
- ~~(3) The capability to support response to events occurring simultaneously at more than one nuclear power reactor site if the emergency operations facility serves more than one site; and~~

Based on the assessment in Section 4.2.21, the NRC staff concluded that KPS is exempt from the requirement to have an EOF, therefore, KPS is exempt from the requirements in 10 CFR Part 50, Appendix E, Section IV.E.8.c.

(4.2.25) 10 CFR 50, Appendix E, Section IV.E.8.d.

~~For nuclear power reactor licensees, an alternative facility (or facilities) that would be accessible even if the site is under threat of or experiencing hostile action, to function as a staging area for augmentation of emergency response staff and collectively having the following characteristics: the capability for communication with the emergency operations facility, control room, and plant security; the capability to perform offsite notifications; and the capability for engineering assessment activities, including damage control team planning and preparation, for use when onsite emergency facilities cannot be safely accessed during hostile action. The requirements in this paragraph 8.d must be implemented no later than December 23, 2014, with the exception of the capability for staging emergency response organization personnel at the alternative facility (or facilities) and the capability for communications with the emergency operations facility, control room, and plant security, which must be implemented no later than June 20, 2012.~~

Based on the assessment in Section 4.2.1, the NRC staff concluded that KPS is exempt from the requirements to implement the security enhancements for a "hostile action" therefore, KPS is exempt from the requirements in 10 CFR Part 50, Appendix E, Section IV.E.8.d.

(4.2.26) 10 CFR 50, Appendix E, Section IV.E.8.e.

DEK requested the following:

A licensee shall not be subject to the requirements of paragraph 8.b of this section for an existing emergency operations facility approved as of December 23, 2011;

The NRC staff grants:

~~A licensee shall not be subject to the requirements of paragraph 8.b of this section for an existing emergency operations facility approved as of December 23, 2011;~~

Although DEK did not request an exemption for the wording "A licensee shall not be subject to the requirements of paragraph 8.b of this section for an existing emergency operations facility approved as of December 23, 2011," the NRC staff considers the difference to be editorial in nature and grants the exemption as written to maintain consistency with the exemption language of the previously granted exemptions.

Based on the assessment in Section 4.2.21, the NRC staff concluded that KPS is exempt from the requirement to have an EOF, therefore, KPS is exempt from the requirements in 10 CFR Part 50, Appendix E, Section IV.E.8.e.

(4.2.27) 10 CFR Part 50, Appendix E, Section IV.E.9.a

Provision for communications with contiguous State/local governments **~~within the plume exposure pathway EPZ.~~** Such communications shall be tested monthly.

Based on the assessment in Sections 4.1.9, the staff concluded that KPS is exempt from the requirements to have an EPZ; therefore, KPS is exempt from the requirements in 10 CFR Part 50, Appendix E, Section IV.E.9.a for providing communications to non-contiguous State and local governments.

(4.2.28) 10 CFR Part 50, Appendix E, Section IV.E.9.c.

DEK requested the following:

Provision for communications among **~~the nuclear power reactor control room, the onsite technical support center, and the emergency operations facility, and among the nuclear facility, the principal State and local emergency operations centers, and the field assessment teams.~~** Such communications systems shall be tested annually.

The NRC staff grants:

~~Provision for communications among the nuclear power reactor control room, the onsite technical support center, and the emergency operations facility, and among the nuclear facility, the principal State and local emergency operations centers,~~

~~and the field assessment teams. Such communications systems shall be tested annually.~~

DEK did not request an exemption from the wording "Provision for communications among," "the nuclear facility, the principal State and local emergency operations," and "Such communications systems shall be tested annually." The NRC staff does not grant the exemption as proposed by DEK. If an exemption was granted as requested, this requirement would be redundant to the requirements in 10 CFR Part 50, Appendix E, Section IV.E.9.a.

Because of the low probability of DBAs or other credible events that would be expected to exceed the EPA PAGs and the available time to initiate mitigative actions consistent with plant conditions and, if necessary, for offsite authorities to employ their CEMP to implement protective actions, there is no need for the TSC, EOF, or offsite field assessment teams.

Based on the assessment in Sections 4.1.1 and 4.2.21, the NRC staff concludes that KPS is exempt from the requirements in 10 CFR Part 50, Appendix E, Section IV.E.9.c, as revised.

(4.2.29) 10 CFR Part 50, Appendix E, Section IV.E.9.d.

DEK requested the following:

Provisions for communications by the licensee with NRC Headquarters and the appropriate NRC Regional Office Operations Center from the nuclear power reactor **control room, the onsite technical support center, and the near-site emergency operations** facility. Such communications shall be tested monthly.

The staff grants:

Provisions for communications by the licensee with NRC Headquarters and the appropriate NRC Regional Office Operations Center from the **nuclear power reactor control room, the onsite technical support center, and the near-site emergency operations** facility. Such communications shall be tested monthly.

Although DEK did not request an exemption for the wording "nuclear power reactor," the NRC staff considers the difference to be editorial in nature and grants the exemption as written to maintain consistency with the exemption language of the previously granted exemptions. The functions of the control room, EOF, TSC and the OSC may be combined into one or more locations due to reduced on-shift and ERO augmentation staffing required for a decommissioning facility and reduced required interaction with State and local emergency response facilities.

Based on the above assessment, and the assessment in Sections 4.1.1 and 4.2.21, the NRC staff concludes that KPS is exempt from the requirements in 10 CFR Part 50, Appendix E, Section IV.E.9.d for "nuclear power reactor control room, the onsite technical support center, and the near-site emergency operations."

(4.2.30) 10 CFR Part 50, Appendix E, Section IV.F.1

The program to provide for: (a) The training of employees and exercising, by periodic drills, of radiation emergency plans to ensure that employees of the licensee are familiar with their specific emergency response duties, and (b) The participation in the training

and drills by other persons whose assistance may be needed in the event of a radiation emergency shall be described. This shall include a description of specialized initial training and periodic retraining programs to be provided to each of the following categories of emergency personnel:

- i. Directors and/or coordinators of the plant emergency organization;
- ii. Personnel responsible for accident assessment, including control room shift personnel;
- iii. Radiological monitoring teams;
- iv. Fire control teams (fire brigades);
- v. Repair and damage control teams;
- vi. First aid and rescue teams;
- vii. Medical support personnel;
- viii. ~~Licensee's headquarters support personnel;~~
- ix. Security personnel.

In addition, a radiological orientation training program shall be made available to local services personnel; e.g., local emergency services/~~Civil Defense~~, local law enforcement personnel, ~~local news media persons~~.

The number of staff required at decommissioning sites is generally small but is commensurate with the need to safely store spent fuel at the facility in a manner that is protective of public health and safety. Decommissioning sites typically have a level of emergency response that does not require additional response by headquarters personnel. Therefore, the staff considers exempting licensee's headquarters personnel from training requirements reasonable. Civil Defense personnel and local news media personnel are not expected to appear on site. Radiological training can be provided to these groups as required without a formal program.

Based on the above assessment, and the assessment in Sections 4.1.1 and 4.2.13, the NRC staff concludes that KPS is exempt from the requirement in 10 CFR Part 50, Appendix E, Section IV.F.1 to provide a training program for "licensee's headquarters personnel," "Civil Defense" and "local news media persons."

(4.2.31) 10 CFR Part 50, Appendix E, Section IV.F.2.

The plan shall describe provisions for the conduct of emergency preparedness exercises as follows: Exercises shall test the adequacy of timing and content of implementing procedures and methods, test emergency equipment and communications networks, ~~test the public alert and notification system~~, and ensure that emergency organization personnel are familiar with their duties.

Based on the assessment in Section 4.1.9, the NRC staff concluded that KPS is exempt from the requirement to have an EPZ, therefore, KPS is exempt from the requirements in 10 CFR Part 50, Appendix E, Section IV.F.2 for: "test the public alert and notification system."

(4.2.32) 10 CFR 50, Appendix E, Section IV.F.2.a.

~~A full participation exercise which tests as much of the licensee, State, and local emergency plans as is reasonably achievable without mandatory public participation shall be conducted for each site at which a power reactor is located.~~

~~Nuclear power reactor licensees shall submit exercise scenarios under § 50.4 at least 60 days before use in a full participation exercise required by this paragraph 2.a.~~

Due to the low probability of DBAs or other credible events that would be expected to exceed the limits of EPA PAGs, the available time to initiate mitigative actions consistent with plant conditions and, if necessary, for offsite authorities to employ their CEMP to implement protective actions, no formal offsite radiological emergency plans are required.

The intent of submitting exercise scenarios at an operating power reactor site is to check that licensees utilize different scenarios in order to prevent the preconditioning of responders at power reactors. For decommissioning power reactor sites, there are limited events that could occur, and as such, the previously routine progression to a general emergency in an operating power reactor site scenario is not applicable.

Based on above assessment, and the assessment in Sections 4.1.1 and 4.2.9, the NRC staff concludes that KPS is exempt from the requirements in 10 CFR Part 50, Appendix E, Section IV.F.2.a.

KPS would be exempt from 10 CFR Part 50, Appendix E, Section IV.F.2.a.(i)-(iii) because the licensee would be exempt from the umbrella provision of 10 CFR Part 50, Appendix E, Section IV.F.2.a.

(4.2.33) 10 CFR 50, Appendix E, Section IV.F.2.b.

DEK requested the following:

Each licensee at each site shall conduct a subsequent exercise of its onsite emergency plan every 2 years. ~~Nuclear power reactor licensees shall submit exercise scenarios under § 50.4 at least 60 days before use in an exercise required by this paragraph 2.b. The exercise may be included in the full participation biennial exercise required by paragraph 2.c. of this section.~~ In addition, the licensee shall take actions necessary to ensure that adequate emergency response capabilities are maintained during the interval between biennial exercises by conducting drills, including at least one drill involving a combination of some of the principal functional areas of the licensee's onsite emergency response capabilities. The principal functional areas of emergency response include activities such as management and coordination of emergency response, accident assessment, event classification, notification of offsite authorities, assessment of the onsite ~~and offsite~~ impact of radiological releases, ~~protective action recommendation development, protective action decision making,~~ plant system repair and mitigative action implementation. During these drills,

activation of all of the licensee's emergency response facilities (~~Technical Support Center (TSC), Operations Support Center (OSC), and the Emergency Operations Facility (EOF)~~) would not be necessary, licensees would have the opportunity to consider accident management strategies, supervised instruction would be permitted, operating staff in all participating facilities would have the opportunity to resolve problems (success paths) rather than have controllers intervene, and the drills may focus on the onsite exercise training objectives.

The NRC staff grants:

Each licensee at each site shall conduct a subsequent exercise of its onsite emergency plan every 2 years. ~~Nuclear power reactor licensees shall submit exercise scenarios under § 50.4 at least 60 days before use in an exercise required by this paragraph 2.b. The exercise may be included in the full participation biennial exercise required by paragraph 2.c. of this section.~~ In addition, the licensee shall take actions necessary to ensure that adequate emergency response capabilities are maintained during the interval between biennial exercises by conducting drills, including at least one drill involving a combination of some of the principal functional areas of the licensee's onsite emergency response capabilities. The principal functional areas of emergency response include activities such as management and coordination of emergency response, accident assessment, event classification, notification of offsite authorities, assessment of the onsite ~~and offsite~~ impact of radiological releases, ~~protective action recommendation development, protective action decision making, plant~~ system repair and mitigative action implementation. During these drills, activation of all of the licensee's emergency response facilities (~~Technical Support Center (TSC), Operations Support Center (OSC), and the Emergency Operations Facility (EOF)~~) would not be necessary, licensees would have the opportunity to consider accident management strategies, supervised instruction would be permitted, operating staff in all participating facilities would have the opportunity to resolve problems (success paths) rather than have controllers intervene, and the drills may focus on the onsite exercise training objectives.

Although DEK did not request an exemption for the wording "plant," the NRC staff considers the difference to be editorial in nature and grants the exemption as written because the term "plant" as used with respect to "system repair" may not be accurate at a later stage of the decommissioning process.

Based on the assessment in Sections 4.2.21 and 4.2.32, the NRC staff exempts KPS of the requirements in 10 CFR 50, Appendix E, Section IV.F.2.b for: "Nuclear power reactor licensees shall submit exercise scenarios under § 50.4 at least 60 days before use in an exercise required by this paragraph 2.b. The exercise may be included in the full participation biennial exercise required by paragraph 2.c. of this Section," "and offsite," "protective action recommendation development, protective action decision making" and "(Technical Support Center (TSC), Operations Support Center (OSC), and the Emergency Operations Facility (EOF))." The remaining requirements of 10 CFR Part 50, Appendix E. Section IV.F.2.b apply to KPS.

(4.2.34) 10 CFR 50, Appendix E, Section IV.F.2.c.

~~Offsite plans for each site shall be exercised biennially with full participation by each offsite authority having a role under the radiological response plan. Where the offsite authority has a role under a radiological response plan for more than~~

~~one site, it shall fully participate in one exercise every two years and shall, at least, partially participate in other offsite plan exercises in this period. If two different licensees each have licensed facilities located either on the same site or on adjacent, contiguous sites, and share most of the elements defining co-located licensees, then each licensee shall:~~

- ~~(1) Conduct an exercise biennially of its onsite emergency plan;~~
- ~~(2) Participate quadrennially in an offsite biennial full or partial participation exercise;~~
- ~~(3) Conduct emergency preparedness activities and interactions in the years between its participation in the offsite full or partial participation exercise with offsite authorities, to test and maintain interface among the affected State and local authorities and the licensee. Co-located licensees shall also participate in emergency preparedness activities and interaction with offsite authorities for the period between exercises;~~
- ~~(4) Conduct a hostile action exercise of its onsite emergency plan in each exercise cycle; and~~
- ~~(5) Participate in an offsite biennial full or partial participation hostile action exercise in alternating exercise cycles.~~

Based on the assessment in Section 4.2.32, the NRC staff concluded that KPS is exempt from the requirements of 10 CFR 50, Appendix E, Section IV.F.2.c.

(4.2.35) 10 CFR 50, Appendix E, Section IV.F.2.d.

~~Each State with responsibility for nuclear power reactor emergency preparedness should fully participate in the ingestion pathway portion of exercises at least once every exercise cycle. In States with more than one nuclear power reactor plume exposure pathway EPZ, the State should rotate this participation from site to site. Each State with responsibility for nuclear power reactor emergency preparedness should fully participate in a hostile action exercise at least once every cycle and should fully participate in one hostile action exercise by December 31, 2015. States with more than one nuclear power reactor plume exposure pathway EPZ should rotate this participation from site to site.~~

Based on the assessment in Section 4.2.32, the NRC staff concluded that KPS is exempt from the requirements of 10 CFR 50, Appendix E, Section IV.F.2.d.

(4.2.36) 10 CFR 50, Appendix E, Section IV.F.2.e.

DEK requested the following:

Licensees shall enable any State or local Government **located within the plume exposure pathway** EPZ to participate in the licensee's drills when requested by such State or local Government.

The NRC staff grants:

Licensees shall enable any State or local Government **located within the plume exposure pathway EPZ** to participate in the licensee's drills when requested by such State or local Government.

Although DEK did not request an exemption for the wording "EPZ," the NRC staff considers the difference to be editorial in nature and grants the exemption as written to maintain consistency with the exemption language of the previously granted exemptions.

The staff concludes that KPS is exempt from the "located within the plume exposure pathway EPZ" requirements in 10 CFR Part 50, Appendix E, Section IV.F.2.e because, as explained in Section 4.1.9, KPS is exempt from the requirement to have EPZs.

(4.2.37) 10 CFR 50, Appendix E, Section IV.F.2.f.

Remedial exercises will be required if the emergency plan is not satisfactorily tested during the biennial exercise, such that NRC, ~~in consultation with FEMA~~, cannot (1) find reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency or (2) determine that the Emergency Response Organization (ERO) has maintained key skills specific to emergency response. **~~The extent of State and local participation in remedial exercises must be sufficient to show that appropriate corrective measures have been taken regarding the elements of the plan not properly tested in the previous exercises.~~**

Based on the assessment in Section 4.2.32, the NRC staff concluded that full participation exercises are not required. FEMA does not have responsibilities related to onsite emergency preparedness, so NRC consultation with FEMA is not necessary. For these reasons, the staff concludes that KPS is exempt from "in consultation with FEMA" and "the extent of State and local participation in remedial exercises must be sufficient to show that appropriate corrective measures have been taken regarding the elements of the plan not properly tested in the previous exercises" requirements of 10 CFR 50, Appendix E, Section IV.F.2.f.

(4.2.38) 10 CFR 50, Appendix E, Section IV.F.2.i.

Licensees shall use drill and exercise scenarios that provide reasonable assurance that anticipatory responses will not result from preconditioning of participants. **~~Such scenarios for nuclear power reactor licensees must include a wide spectrum of radiological releases and events, including hostile action.~~** Exercise and drill scenarios as appropriate must emphasize coordination among onsite and offsite response organizations.

In the SOC for the 2011 EP final rule (Reference 24), the NRC discussed the addition of a new Section IV.F.2.i to Appendix E to require all nuclear power reactor licensees to include hostile action in biennial evaluated exercises. The EP final rule also ensures that scenarios will be sufficiently varied by requiring the use of a wide spectrum of radiological releases and events to properly train responders to respond to events more realistic than those currently used in training, and to avoid preconditioning the responders to success with inappropriate anticipatory responses.

In the EP Final Rule, the NRC identified this requirement as specific for power reactor licensees. The staff considered the similarity between the KPS facility and a non-power reactor for the low likelihood of any credible accident resulting in radiological releases requiring offsite protective measures. The results of analyses of design-basis and hypothetical accident conditions evaluated for the KPS show that there is substantial design margin for safety to the public and on-site personnel. Unlike nuclear power plants, permanently shutdown and defueled plants have a low risk of a radiological release and a smaller spectrum of possible events.

Based on the above assessment and the assessment provided in Sections 4.1.2 and 4.2.1, the NRC staff concludes that KPS is exempt from requirement of 10 CFR Part 50, Appendix E, Section IV.F.2.i for "Such scenarios for nuclear power reactor licensees must include a wide spectrum of radiological releases and events, including hostile action."

(4.2.39) 10 CFR 50, Appendix E, Section IV.F.2.j.

~~The exercises conducted under paragraph 2 of this section by nuclear power reactor licensees must provide the opportunity for the ERO to demonstrate proficiency in the key skills necessary to implement the principal functional areas of emergency response identified in paragraph 2.b of this section. Each exercise must provide the opportunity for the ERO to demonstrate key skills specific to emergency response duties in the control room, TSC, OSC, EOF, and joint information center. Additionally, in each eight calendar year exercise cycle, nuclear power reactor licensees shall vary the content of scenarios during exercises conducted under paragraph 2 of this section to provide the opportunity for the ERO to demonstrate proficiency in the key skills necessary to respond to the following scenario elements: hostile action directed at the plant site, no radiological release or an unplanned minimal radiological release that does not require public protective actions, an initial classification of or rapid escalation to a Site Area Emergency or General Emergency, implementation of strategies, procedures, and guidance developed under § 50.54(hh)(2), and integration of offsite resources with onsite response. The licensee shall maintain a record of exercises conducted during each eight year exercise cycle that documents the content of scenarios used to comply with the requirements of this paragraph. Each licensee shall conduct a hostile action exercise for each of its sites no later than December 31, 2015. The first eight year exercise cycle for a site will begin in the calendar year in which the first hostile action exercise is conducted. For a site licensed under Part 52, the first eight year exercise cycle begins in the calendar year of the initial exercise required by Section IV.F.2.a.~~

In the SOC for the 2011 EP Final Rule (Reference 24), the NRC discussed the addition of a new Section IV.F.2.j to Appendix E to require all nuclear power reactor licensees to provide an opportunity for the emergency response organization (ERO) to demonstrate proficiency in response to a wide spectrum of scenarios, including a "hostile action" and a loss of large areas of the plant due to fire or explosion. It further provides that the ERO must demonstrate key skills specific to emergency response duties in the control room, TSC, OSC, EOF and joint information center.

In the 2011 EP final rule, the NRC identified this requirement as specific for nuclear power reactor licensees. Additionally, with the current conditions of the site, where only the SFP, the ISFSI and their related support systems, structures, and components remain, there are no other facilities in which ERO personnel could demonstrate proficiency. Based on the above

assessment and the assessment in Section 4.2.38, the NRC staff concludes that KPS is exempt from the requirements in 10 CFR Part 50, Appendix E, Section IV.F.2.j.

(4.2.40) 10 CFR 50, Appendix E, Section IV.I.

~~By June 20, 2012, for nuclear power reactor licensees, a range of protective actions to protect onsite personnel during hostile action must be developed to ensure the continued ability of the licensee to safely shut down the reactor and perform the functions of the licensee's emergency plan.~~

Based on the assessment provided in Section 4.2.1, the NRC staff concluded that KPS is exempt from the requirement to implement the security enhancements for a "hostile action," therefore, KPS is exempt from the requirement in 10 CFR Part 50, Appendix E, Section IV.I.

5.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Wisconsin State official was notified of the proposed exemption. The State official had no comments.

6.0 ENVIRONMENTAL CONSIDERATION

Finding Of No Significant Impact

In accordance with 10 CFR 51.31(a), the Commission has determined that the granting of this exemption will not have a significant effect on the quality of the human environment as discussed in the NRC staff's Finding of No Significant Impact and associated Environmental Assessment published October 07, 2014 (79 FR 60513).

7.0 CONCLUSION

The NRC staff concluded that the licensee's request for an exemption from certain requirements of 10 CFR 50.47(b), 10 CFR 50.47(c), and Appendix E to 10 CFR Part 50, as specified in this safety evaluation, is acceptable in view of the greatly reduced offsite radiological consequences associated with the permanently shutdown KPS. The conclusion is consistent with the staff's evaluation as provided to the Commission in SECY-14-0066 (Reference 9), which was approved by the Commission in the SRM to SECY-14-0066 (Reference 10).

The review considered the permanently shutdown and defueled status of KPS and the low likelihood of any credible accident resulting in radiological releases requiring offsite protective measures. This safety evaluation was supported by the licensee's analyses and staff's assessment of both DBAs and beyond DBAs. The NRC staff concludes that the emergency planning requirements for KPS, as modified by the exemptions described in this safety evaluation, would provide: (1) an adequate basis for an acceptable state of emergency preparedness; and (2) in conjunction with arrangements made with offsite response agencies, reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency at KPS. The KPS Defueled Emergency Plan incorporating these exemptions will be reviewed separately under the 10 CFR 50.90 license amendment process.

8.0 REFERENCES

1. Letter from Dominion Energy Kewaunee, Inc. to U.S. Nuclear Regulatory Commission, "Docket 50-305 – License DPR-43 – Kewaunee Power Station - Certification of Permanent Cessation of Power Operations," dated February 25, 2013, (ADAMS Accession No. ML13058A065).
2. Letter from Dominion Energy Kewaunee, Inc. to U.S. Nuclear Regulatory Commission, "Docket 50-305 – License DPR-43 – Kewaunee Power Station – Certification of Permanent Removal of Fuel From the Reactor Vessel", dated May 14, 2013, (ADAMS Accession No. ML13135A209).
3. Letter from Dominion Energy Kewaunee, Inc. to U.S. Nuclear Regulatory Commission, "Docket 50-305 – License DPR-43 – Kewaunee Power Station – Request for Exemptions from Portions of 10 CFR 50.47 and 10 CFR 50, Appendix E," dated July 31, 2013, (ADAMS Accession No. ML13221A182).
4. Letter from Dominion Energy Kewaunee, Inc. to U.S. Nuclear Regulatory Commission, "Docket 50-305 – License DPR-43 – Kewaunee Power Station Supplement I and Response to Request for Additional Information Regarding Request for Exemptions from Portions of 10 CFR 50.47 and 10 CFR 50, Appendix E" dated December 11, 2013, (ADAMS Accession No. ML13351A040).
5. Letter from Dominion Energy Kewaunee, Inc. to U.S. Nuclear Regulatory Commission, "Docket 50-305 – License DPR-43 – Kewaunee Power Station Supplemental Response to Request for Exemptions from Portions of 10 CFR 50.47 and 10 CFR, Appendix E", dated January 10, 2014 (ADAMS Accession No. ML14016A078).
6. NUREG/CR-6451, "A Safety and Regulatory Assessment of Generic BWR and PWR Permanently Shutdown Nuclear power Plants," August 1997.
7. U.S. Nuclear Regulatory Commission, NUREG-2161: "Consequence Study of a Beyond-Design-Basis Earthquake Affecting the Spent Fuel Pool for a U.S. Mark I Boiling Water Reactor" dated September 2014 (ADAMS Accession No. ML14255A365).
8. U.S. Nuclear Regulatory Commission, NUREG-1738: "Technical Study of Spent Fuel Accident Risk at Decommissioning Nuclear Power Plants," dated February 2001, (ADAMS Accession No. ML010430066).
9. U.S. Nuclear Regulatory Commission, "Request by Dominion Energy Kewaunee, Inc. for Exemptions from Certain Emergency Planning Requirements", SECY-14-0066 dated June 27, 2014 (ADAMS Accession No. ML14072A257).
10. U.S. Nuclear Regulatory Commission, "Staff Requirements Memorandum – SECY-14-0066 – Request by Dominion Energy Kewaunee, Inc. for Exemptions from Certain Emergency Planning Requirements", SECY-14-0066 dated August 7, 2014 (ADAMS Accession No. ML14219A366).
11. U.S. Nuclear Regulatory Commission, Approval of Defueled Station Emergency Plan and Exemption from Requirements of 10 CFR 50.47 for Zion Nuclear Power Station, dated August 31, 1999 (ADAMS Legacy Accession No. 9909070079).

12. Spent Fuel Project Office Interim Staff Guidance – 16, “Emergency Planning,” dated June 14, 2000 (ADAMS Accession No. ML003724570).
13. NRC Regulatory Guide (RG) 1.183, “Alternative Radiological Source Terms for Evaluating Design Basis Accidents at Nuclear Power Reactors,” July 2000, (ADAMS Accession No. ML003716792).
14. NUREG-0800, “Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR [Light-Water Reactor] Edition,” (SRP), Section 15.0.1, “Radiological Consequence Analyses Using Alternative Source Terms,” July 2000 (ADAMS Accession No. ML003734190).
15. Environmental Protection Agency’s “Protective Action Guide and Planning Guidance for Radiological Incidents,” Draft for Interim Use and Public Comment dated March 2013 (PAG Manual).
16. Letter from Dominion Energy Kewaunee, Inc. to U.S. Nuclear Regulatory Commission, “Docket 50-305 – License DPR-43 – Kewaunee Power Station License Amendment Request 257, Permanently Defueled Emergency Plan and Emergency Action Level Scheme dated January 16, 2014 (ADAMS Accession No. ML14029A076).
17. NRC approval of License Amendment 200, which was issued November 20, 2008 (ADAMS Accession No. ML082971079).
18. NRC approval of License Amendment 205, which was issued April 30, 2009 (ADAMS Accession No. ML090570710).
19. NUREG-0612, “Control of Heavy Loads at Nuclear Power Plants: Resolution of Generic Technical Activity A-36,” July 1980.
20. DEK letter dated August 23, 2013, Request to Rescind Order Modifying Licenses with Regard to Requirements for Reliable Spent Fuel Pool Instrumentation, ADAMS Accession No. ML13242A018).
21. NUREG/CR-4982, “Severe Accidents in Spent Fuel Pools in Support of Generic Safety Issue 82,” July 1987.
22. Letter from Dominion Energy Kewaunee, Inc. to U.S. Nuclear Regulatory Commission, “Docket 50-305 – License DPR-43 –DEK request to rescind NRC Order EA-12-049, “Order to Modify Licenses with Regards to Requirements for Mitigation Strategies for Beyond-Design-Basis Events” dated August 23, 2014 (ADAMS Accession No. ML13242A019).
23. NUREG-0396, “Planning Basis for the Development of State and Local Government Radiological Emergency Response Plans in Support of Light Water Nuclear Power Plants, “ dated November 1978 (ADAMS Accession No. ML051390356)
24. 2011 EP Final Rule, “Enhancements to Emergency Preparedness Regulations,” published in the *Federal Register* (FR) (76 FR 72560) and associate Statements of Consideration (76 FR 72589) dated November 23, 2011

25. U.S. Nuclear Regulatory Commission, NUREG-0696, "Functional Criteria for Emergency Response Facilities," dated February 1981, (ADAMS Accession No. ML051690040).

Principal Contributors: M. Norris, NSIR
M. Wasem, NSIR
S. Jones, NRR
D. Duvigneaud, NRR

Date: October 27, 2014

October 27, 2014

Mr. David A. Heacock
President and Chief Nuclear Officer
Dominion Energy Kewaunee, Inc.
Innsbrook Technical Center
5000 Dominion Boulevard
Glen Allen, VA 23060-6711

SUBJECT: KEWAUNEE POWER STATION – EXEMPTIONS FROM CERTAIN
EMERGENCY PLANNING REQUIREMENTS AND RELATED SAFETY
EVALUATION (TAC NO. MF2567)

Dear Mr. Heacock:

The U.S. Nuclear Regulatory Commission (NRC) has approved the enclosed exemptions from specific requirements of Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50.47, "Emergency plans," and Appendix E, "Emergency Planning and Preparedness for Production and Utilization Facilities," to 10 CFR Part 50. This action is in response to your application for exemptions dated July 31, 2013, "Request for Exemptions from Portions of 10 CFR 50.47 and 10 CFR 50, Appendix E Section IV," supplemented by letters dated December 11, 2013, and January 10, 2014.

A copy of the exemptions and the NRC staff's safety evaluation are also enclosed. The exemptions will be forwarded to the Office of the Federal Register for publication.

Sincerely,

/RA/ James Kim for

Thomas J. Wengert, Senior Project Manager
Plant Licensing IV-2 and Decommissioning
Transition Branch
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-305

Enclosures:

1. Exemptions
2. Safety Evaluation

cc w/encl: Distribution via Listserv

DISTRIBUTION:

PUBLIC
LPL4-2 R/F
RidsNrrPMKewaunee Resource
RidsRgn3MailCenter Resource

RidsNrrDorLpl4-2 Resource
RidsNrrLAMHenderson Resource
RidsAcraAcnw_MailCTR Resource
JJandovitz, EDO Region 3

RidsNrrDraArCb Resource
RidsNrrDssSpsb Resource
RidsNsirDprDdep Resource

**via email

*via memorandum

ADAMS Accession Nos.: Letter ML14261A223; Exemption FRN ML14261A227

OFFICE	NRR/DORL/LPL4-2/PM	NRR/DORL/LPL4-2/PM	NRR/DORL/LPL4-2/LA	NSIR/DPR/DDEP/BC	NRR/DSS/SBPB/BC
NAME	WHuffman	TWengert	MHenderson	JAnderson*	GCasto*
DATE	10/01/14	10/01/14	09/29 /14	08/18/14	08/25/14
OFFICE	NRR/DRA/ARCB/BC	OGC - NLO	NRR/DORL/LPL4-2/BC	NRR/DORL/D	NRR/DORL/LPL4-2/PM
NAME	UShoop*	Suttal	DBroadus**	MEvans	TWengert (JKim for)
DATE	05/20/14	10/09/14	10/23/14	10/27/14	10/27/14

OFFICIAL RECORD COPY